August 9, 1948

STEEL

AUG

The Magazine of Metalworking and Metalproducing

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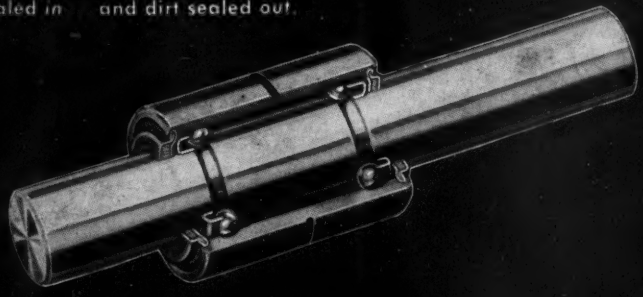
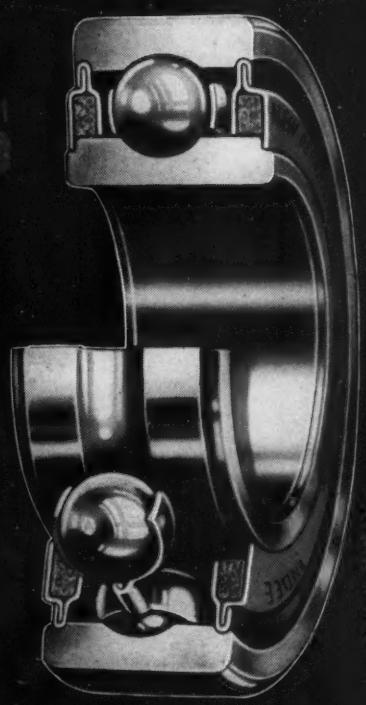
EDITORIAL INDEX, PAGE 37

Performance has sold over 126,000,000 New Departure Sealed-for-life Ball Bearings



Fan and Water Pump bearing with permanent supply of grease sealed in and dirt sealed out.



General Purpose bearing, completely sealed and lubricated for life. For more facts, ask for booklet "Sealed."

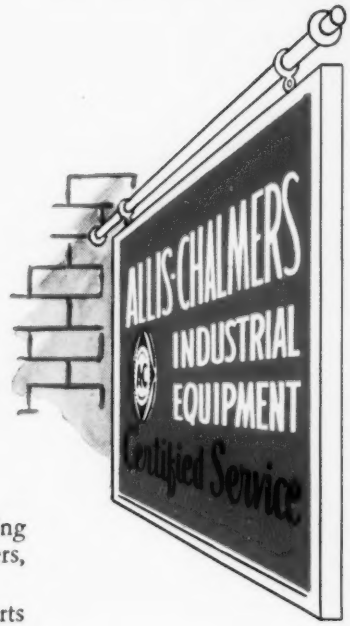
Originated, developed and Built to be forgotten by NEW DEPARTURE

(rolls like a ball)

NEW DEPARTURE • Division of GENERAL MOTORS • BRISTOL, CONNECTICUT

"Certified" Service

AN ADDED REASON FOR INVESTING IN ALLIS-CHALMERS MOTORS!



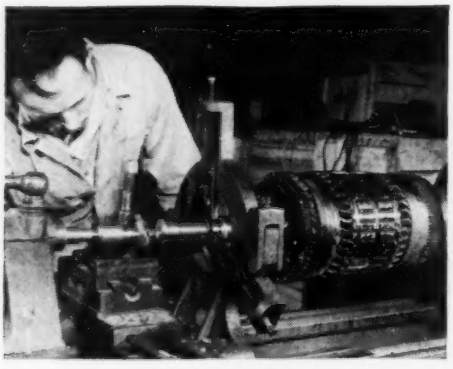
IT MEANS: 1) *Better, Faster Service.* Independent local repair shops are now being selected and authorized to service and repair Allis-Chalmers Motors, Transformers, Controls, Pumps — and "Certify" them as to workmanship.

2) *Finest Parts and Workmanship.* Shops use genuine Allis-Chalmers repair parts — or parts of equal quality; and are given complete service information, including factory procedure and drawings where necessary.

3) *Friendly Service.* Every Allis-Chalmers "Certified" Service Shop has been selected on the basis of its reputation in its community. It's the kind of company you *like* to do business with!

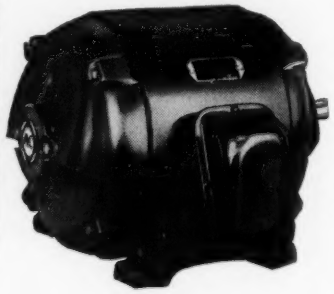
How can you get this service? For the present most "Certified" Service Shops are located in the larger U. S. industrial areas . . . but they're expanding rapidly. Call your nearby A-C District Office or Authorized Dealer for closest recommended shop. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

FINER, FASTER, FRIENDLIER SERVICE FOR INDUSTRY!



The A-C Supply Company of Cuyahoga Falls, Authorized Allis-Chalmers Dealer and newly-appointed "Certified" Service Shop, is staffed and equipped to give prompt, efficient, top-quality repair and service aid to customers in the greater Akron industrial area. Typical of the kind of "Certified" Service organizations being selected throughout U.S.

MANY SIZES, RATINGS OF ALLIS-CHALMERS STANDARD SQUIRREL-CAGE MOTORS ARE NOW AVAILABLE FROM STOCK. CHECK YOUR AUTHORIZED A-C DEALER, OR DISTRICT OFFICE FOR DETAILS.



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ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment—Biggest of All in Range of Industrial Products

Research keeps
B.F.Goodrich
FIRST IN RUBBER

How to make one belt do the work of two

Patented B. F. Goodrich splice ends 90% of belt breakdowns

WHEN a belt breaks down, production stops and costs mount. B. F. Goodrich technical men found that over 90% of belt breakdowns occurred where belt ends were pinned or riveted together by metal fasteners. They set out to develop a method of making belts endless, that would *keep* them that way.

The result was the patented Plylock Splice that uses no metal fasteners or lacing. The outer ply ends of the belt are tucked beneath the surface of the belt and vulcanized *permanently* into position.

Some plants using this method of making transmission belts endless report that belt costs are reduced as much as 75%, that one belt now lasts as long as two or three metal-fastened belts used to. Work stoppages for frequent repairs and maintenance are practically eliminated. Because the Plylock Splice can be made right on the drive, there is no need to dismantle machinery to make it. Endless belts are now available in hours—belts can be used as soon as vulcanization is completed. Plant interruptions are held to a minimum.

Plylock Splice gives smoother operation too. Belts are uniform in thickness throughout their entire length. That means a smoother, even flow of power, without slippage or bumping, noise or vibration. The Plylock Joint is as flexible as the rest of the belt.

B. F. Goodrich distributors make the Plylock Splice in their shops or on your machines; or they will instruct your own mechanics in making it. See your local distributor or write: *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F.Goodrich
RUBBER FOR INDUSTRY

Behind the Scenes...

Walker Walks In & Out

Since the give-away shows are currently subject for much discussion in the press as well as the parlor, it was probably inevitable that at least a veiled reference to same would make its appearance in the advertising pages of this book. We noted in our July 26 issue that the walking man walked right in to a weld shop, contributing to high costs and inefficiency. That comes from the Harnischfeger ad, of same issue, which also proposes that the walking man be taken right out again via the remote controlled welder they're making up in Milwaukee.

Names (ours) in the News

Your favorite daily newspaper probably carries a story every Monday based on what our editors have in the book. As our clipping service will readily admit, most newspapers do. A couple of weeks ago what STEEL said made a lot of front page news in Detroit, when our editors were talking about the effects of higher steel prices on automobile prices. Not only that, our Detroit editor, Mr. A. H. Allen, who has been known for twenty years around this shop as Art, was mentioned on page 1, along with a few well-chosen comments as befitting an expert. And in Cleveland News Editor Bill Rooney was quoted the other day as an expert on the steel price situation and results of the f.o.b. mill prices on industry.

Tooled & Ready To Go

Next week's book will present the first installment of a new series of extremely valuable articles in tabular form, devoted to tool steels. More than a year ago the editors decided there was a real need in the industry for a complete handbook on tool steels. Many producing companies have issued handbooks on their own products, but right up to now there has been no composite handbook which would show all the different brands of tool steels, who makes them, what are their physical properties, their analyses and their principal applications. It has been a long task and a difficult one, but our staff has finally completed its work, all the data have been checked, and the finished masterpiece is about to be unveiled. Reams of correspondence and hundreds of miles of travel have been thrown into the hopper, along with the best thinking and planning possible to make this one of the most worthwhile projects which our staff has ever tackled. There will be seven installments in the series, starting in our August 16 issue and winding up September 27. If your plant uses tool steels for any operations, you will want to be sure to mark this series for special attention.

More Copies Available

Our Readers Service Department seems to be withstanding the deluge in fair shape—demands made by you folks for extra copies of that 2-page table on f.o.b. mill locations. We're again ready to fill requests, so if you'd like a copy, we'll tell Hildegarde, our gal in charge of mailing out reprints and tearsheets, and she'll set the machinery in motion to fill your request. Drop us a line.

Puzzle Corner

As any mathematician of high or low degree could plainly see, the answers to our fractions problem of July 26 issue were 2/3 and ¾. Since this is the height of the playground season, let's worry about three boys who are playing on a seesaw. The gadget has a seat on each end, five feet away from the fulcrum. Robby and Allen are sitting in the seats, while Chuck, who weighs 80 pounds, balances them by sitting on Allen's side, 21 inches from the fulcrum. They decide to switch around, and Chuck sits in one seat while the other two boys sit on the opposite end, Allen in the seat and Robby a foot nearer the center. Then Robby decides to sit in the seat. Where must Allen sit to balance Chuck?

Double Take on Barbecues

We told a little story in our column of that July 26 issue about a fancy outdoor barbecue, and we hasten to point out right here and now that it was purely a coincidence that 16 pages later the Barium Steel Corp. had an intriguing ad with a central illustration of a backyard barbecue, complete with a hint on how to make barbecued hamburgers taste better. When we wrote the copy for that paragraph, the Barium plate hadn't even been shipped to our printshop. Just another indication of how great thinking runs parallel, thass all.

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STEEL

Vol. 123—No. 6 August 9, 1948

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Published every Monday. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Single copies (current issues) 35c. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1948 by the Penton Publishing Co.

Editorial Staff on Contents Page

ABC ABP

August 9, 1948

Tight Period Ahead!

According to present indications, the problem of procuring steel will become more acute in the early future. Already voluntary allocations under Public Law 395 call for 5,420,784 tons of steel annually. This is earmarked for freight cars, atomic energy projects, warm air furnaces, prefabricated housing, armed services, oil field tank and production equipment, barges and equipment for hard coal mines.

Still in the discussion stage are allocations for shipbuilding, oil storage tanks, truck-trailers, agricultural machinery and equipment for soft coal mines. In addition is the sizable tonnage ECA will request for the Marshall plan. Also it is probable that the present commitment of 105,273 tons monthly for the armed services will be increased sharply.

The amount of steel involved in these actual and pending allocations cannot be subtracted from the nation's output without seriously affecting consumers who draw their supplies from the open market. Unless something happens to permit a reduction in the tonnage allocated to officially favored projects, ordinary consumers will have to get along with less steel than they have been receiving.

Right now it is difficult to conceive of any single factor that could affect this grim outlook appreciably. If there is to be any relief from the indicated increased scarcity, it must come from a combination of several factors. Increases in steelmaking capacity and perhaps a better "mix" of rolling mill facilities may help moderately. As iron and steel output abroad improves, it may be possible to substitute some foreign tonnage for Marshall plan steel from the United States or even to increase the trickle of ferrous materials now coming to our shores from dollar-needful European nations.

On the consumer side, relief can come from better utilization of steel. Manufacturers have barely scratched the surface of opportunity for using high strength steels instead of ordinary steels. An educational campaign probably could postpone some not-too-urgent private projects and many public works programs—which would be a godsend later, when demand is tapering off. Ingenuity in design and manufacturing methods can help to make each ton of steel go farther.

Exhausting every one of these opportunities is about the only way we can get through the coming tight period without serious trouble.

* * *

ACCENT ON TRANSPORT: Adoption of mill pricing for steel has prompted both sellers and buyers to intensify their study of transportation. They are evidencing a new wave of interest not only in freight rates, but also in the possibility of turning from rail to highway or waterway transport.

Steel producers who find themselves at a disadvantage in important consuming market centers are likely to seek relief by requesting lower freight rates. Typical of this attitude is the proposal by Carnegie-Illinois Steel Corp. and American Bridge Co. that railroads reduce freight rates 40 per cent on steel shipped from the Pittsburgh district to Detroit and New York. Steel producers in many other steel producing centers also are at a disadvantage in the Detroit and New York markets that varies only in degree from the plight of Pittsburgh mills. They too could and may propose lower freight rates.

Buyers, who now must assume the burden of paying the cost of shipping from mill to consuming point, are probing the intricacies of

(OVER)

shipping costs. In many cases this may lead to attempts to divert rail shipments to highway truckers. In a few rare instances, inland waterway transport may offer economies.

The significant point is that mill pricing accentuates the importance of transportation and in time may exert strong pressure for changes in the intricate rate structure. Modifying long-established tariffs to meet new conditions usually ends in helping one group of shippers at the expense of other groups. The impact of mill pricing on transportation could result in far-reaching complications. —pp. 45, 46

* * *

FEW WAR PLANTS IDLE: **War Assets Administration, which is scheduled to close up shop next Feb. 28, has done a creditable job in disposing of surplus iron and steel plants.**

Dollar-wise, it has disposed of 87.5 per cent of its inventory of so-called "iron and steel" properties. Of the 151 properties on its program, 99 have been sold. Of the 52 remaining, 30 have been taken over by their wartime operators on long-term leases, 8 are being operated on interim leases, and only 14 are not in operation. This record indicates a much higher utilization of war-built plants in peacetime than anyone had dared to predict at the time the war ended.

The 52 properties remaining unsold include two blast furnaces and forge shops, foundries, mines and ordnance plants. Some of the government-owned iron and steel producing facilities are so badly scrambled with privately-owned properties that outright sale involves major difficulties. The most wholesome aspect of the situation is that so few of the war plants are idle. —p. 48

* * *

STEEL NOT OVER-PRICED: Chairman Eugene G. Grace of Bethlehem Steel Corp presented interesting price comparisons at a press conference following the corporation's last quarterly board meeting. Since 1939, Bethlehem's steel prices — including base prices, extras and everything else contributing to sales income — have increased 67 per cent. During the same period, he reported, prices paid by Bethlehem for fuel oil increased 193 per cent, for coal 130 per cent, scrap 194 per cent, coke 144 per cent, lead 354 per cent, tin 120 per cent. zinc 212 per cent and labor wages 101 per cent.

These Bethlehem figures probably are fairly representative of the entire industry. Taken in conjunction with earnings in the second quarter of 5 per cent on sales and 8.4 per cent on investment, they refute any reasonable charge that steel is over-priced. —p. 51

* * *

IMPORT FOUNDRY IRON: Packard Motor Car Co. has been receiving pig iron from Holland and has negotiated for additional tonnage from Belgium. An Ohio foundry has received a small shipment of foundry iron from France.

These are illustrative of the driblets of pig iron that American foundrymen have ordered from abroad to augment their inadequate supplies from domestic sources. The cost is excessive and the quality is inferior but by mixing small doses of the imported material with domestic iron foundrymen manage to increase their output of castings.

Significance of these importations is highlighted by the fact that pig iron output in the United States in the first half of 1948 was half a million tons under production in the comparable 1947 period, due to the April coal strike. Foundrymen do well to eke out their needs from dollar-hungry suppliers abroad. —p. 59

* * *

STRESS EASE AT 350° F: Conventional method of relieving residual stresses in welded structures is to heat the entire welded section to 1100 to 1200° F. This procedure is effective, but it requires large equipment, is costly and cannot be used on large welding jobs such as ships and large storage tanks.

Following two years of research, a new method of stress relieving has been developed which can be applied to ships, large pressure vessels and large structures welded in the field. It consists of moving oxyacetylene blowpipe flames parallel to and on each side of the weld to provide a moving zone of heat at approximately 350° F. Water or air-water sprays impinge upon the work about 6 inches behind the advancing heating flames.

This method, designated as controlled low-temperature stress relieving, will command attention chiefly because of its adaptability to welded structures which cannot be stress relieved by conventional means and because of its economy. —p. 78

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

PRICING— Now burdened with all the freight charges on their steel purchases, consumers are deeply engaged in research (p. 45) on ways of lightening this load. For advantages they're exploring all avenues—truck, water and rail rates, as well as possibilities of buying from nearest steel mills. Meanwhile, a Senate Interstate & Foreign Commerce subcommittee is preparing to go into high gear on a review (p. 46) of the entire pricing situation.

NO BIG SHOW— The House Banking Committee's hearing on the President's anti-inflation program will not include a full scale investigation (p. 47) of recent steel price increases, although a committee member would like to see one. Such a probe is not necessary, says another member who declares the sole cause of high prices has been policies pursued by the U. S. government the last 15 years.

FOR SALE— Although the War Assets Administration, dollar-wise, has sold 87.5 per cent of the iron and steel plants built by the government during the last war it still has 52 of the 151 properties in the program (p. 48). Left principally are the smaller plants. In several cases disposal is difficult because the government-owned facilities are badly scrambled up with those of their wartime operators.

SCRAP— Iron and steel scrap stockpiling is not advisable now (p. 49), says R. J. Wysor of the National Security Resources Board staff. Stockpiling would take the already scarce material from the market, and at present prices the cost would be staggering. And being largely a domestic resource, scrap would not be cut off in event of war, he explains.

EXPANDING MARKET— With migration to the West Coast continuing that area's requirements of steel products (p. 50) are increasing by leaps and bounds. Symbolic of this trend, a new 1637-mile gas pipeline from Texas to California to help fill the growing need in that region for fuel will require more than 500,000 tons of steel.

EXPEDITING— Europeans want American machine tools but find dollar shortages block their procurement efforts. Consequently, Alexander G. Bryant, president, National Machine Tool Builders' Association, has gone to Europe (p. 55) to implement efforts to release $125 million worth of machine tool orders held up for lack of credit.

LOOKING FOR ORE— With the nation's iron ore reserves being depleted rapidly Republic Steel Corp., which gets part of its ore from New York state, is conducting an extensive program of exploratory diamond drilling (p. 55) in some of that state's ore properties which have been idle 40 years.

SHORTAGES EASING— Steel production in France is easily covering all steel needs there (p. 56) with the exception of sheets and plates. And ambitious expansion plans to overcome shortage of those products are under way.

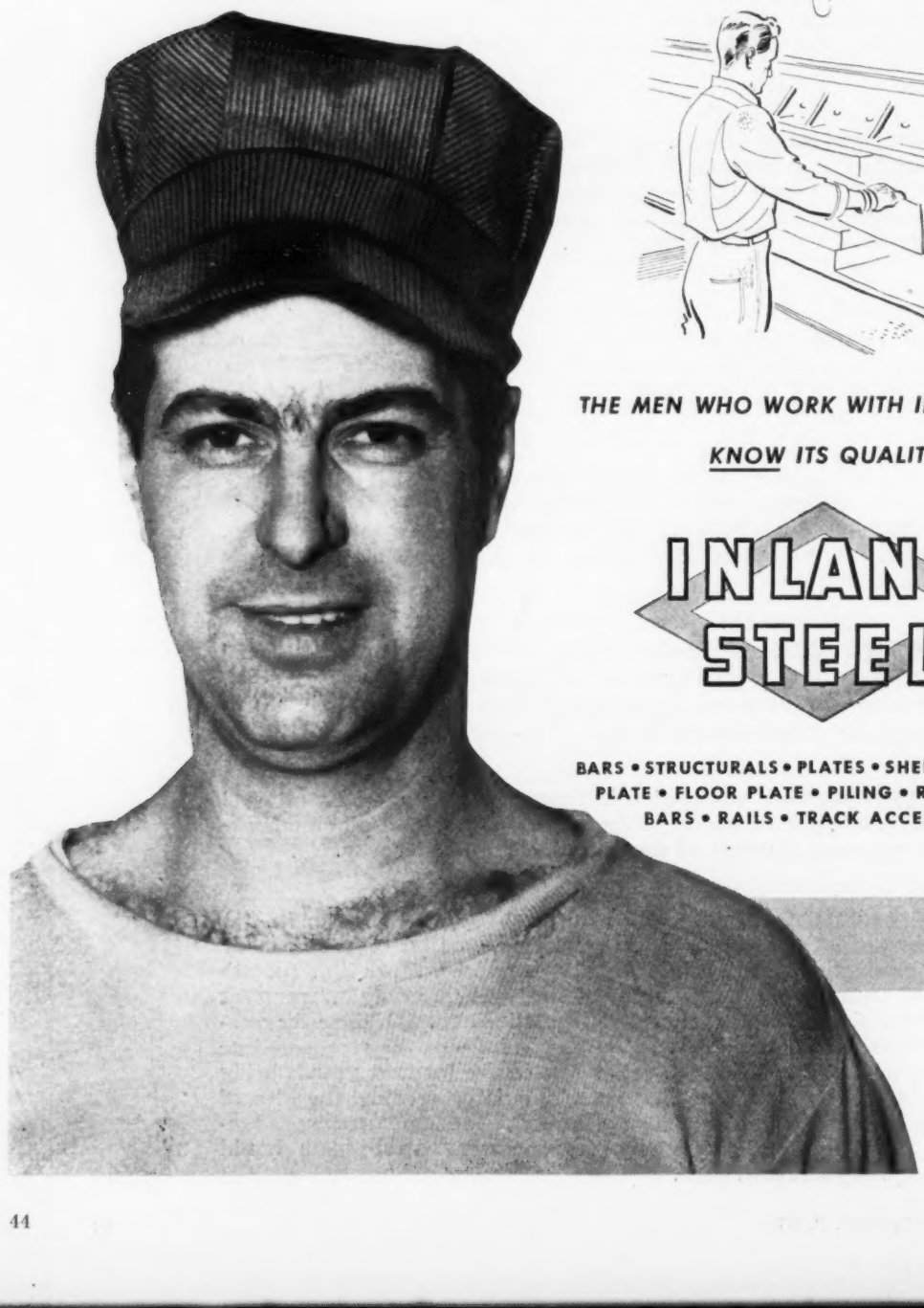
HERE AND THERE IN INDUSTRY— Bethlehem Steel Corp.'s chairman (p. 51) sees no further important advances soon in steel prices, unless costs run away . . . Alloy steel production the first half of this year rose 7.7 per cent (p. 51) over the like 1947 period while total output of steel went up only 1.7 per cent . . . First major revision of patent rules and regulations (p. 52) since they originated in 1836 has been completed . . . So successful was the recent college short course in machine tool selling (p. 55) that a course for next year is being charted . . .Although dismantling of German plants is proceeding, the idea of abandoning such a course (p. 56) in favor of reparations from current production is gaining . . . Surveys to determine whether one or two steel plants should be built in India (p. 57) will start soon.

Engineering News, P. 73 *Market Summary, P. 127*

NEWS SUMMARY

"I like the UNIFORMITY of Inland Steel"

PRESS brake operators know that time and material losses—due to cracking and scoring—rise rapidly when the steel sheets they bend *vary* in chemical composition, mechanical or surface characteristics. That's why they prefer steel that's *uniform . . . steel made by Inland.* Uniform source of raw materials, uniform steelmaking procedures using the same modern equipment, uniform workmanship—made possible by Inland's completely integrated, closely knit plant—explain why the Inland Steel received today will be of the same high quality as that received last month . . . or last year. INLAND STEEL CO., 38 S. Dearborn St., Chicago, Ill. Sales Offices: Chicago, Davenport, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.



THE MEN WHO WORK WITH INLAND STEEL

KNOW ITS QUALITY!

INLAND STEEL

BARS • STRUCTURALS • PLATES • SHEETS • STRIP • TIN PLATE • FLOOR PLATE • PILING • REINFORCING BARS • RAILS • TRACK ACCESSORIES

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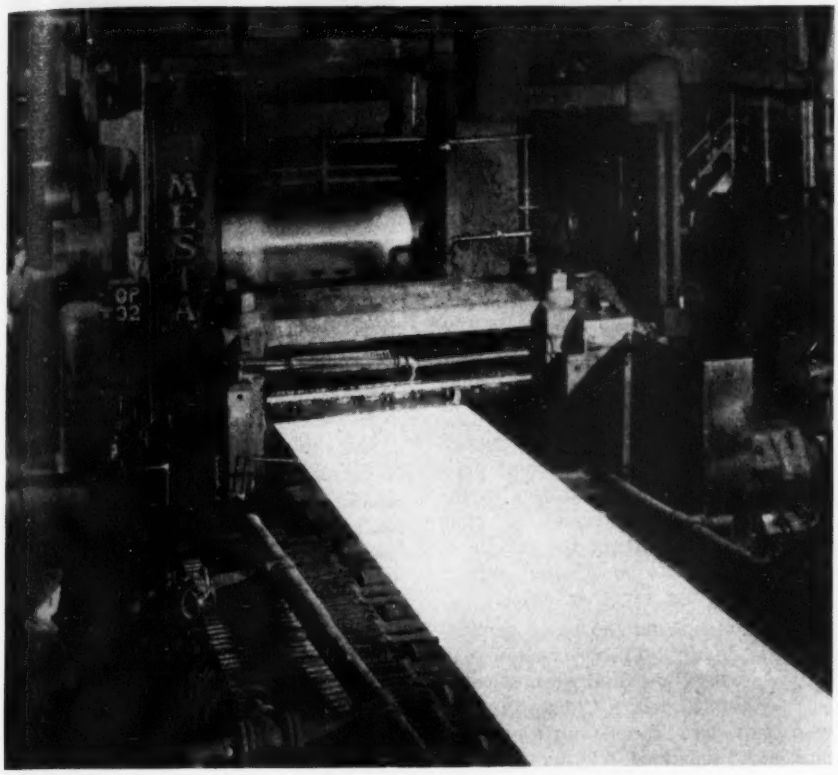


HOT STRIP STEEL BEING ROLLED ON PITTSBURGH DISTRICT MILL

Steel Freight Costs Studied

Adoption of f.o.b. mill pricing by steel industry throws entire shipping cost burden on consuming industry. Switch to truck and water transport limited by lack of facilities

ABANDONMENT of multiple basing point pricing by the steel industry, resulting in passing along to consumers full freight charges from producing points to buyers' plants, is causing plenty of research by manufacturers' purchasing and traffic departments into steel costs under the new freight arrangement.

Considerable talk is heard of likely widespread turning from rail to truck and water transport. However, extent of such a switch is limited by lack of loading, handling and shipping facilities. Nevertheless, in time necessary facilities could be made available, such as trucks, handling and loading equipment, barge, and river and lake terminal facilities.

Seek Freight Data—Meanwhile, until truck and water transport facilities are able to care for heavier load steel buyers, chief dependence will be on the railroads. Manufacturers, therefore, are seeking all possible information on freight rates. But they are having a time getting what they want. One serious stumbling block is inability to get rate information promptly. Railroad freight departments are literally swamped by requests for such data, so much so that they say an ordinary letter of inquiry might receive a reply in six months.

Take Gloomy View—Many steel users take the gloomy view that f.o.b. mill pricing ultimately will mean the destruction of competition among steel mills as far as quality and service are concerned, leaving geographical proximity to the customer the sole gage of sales.

As one straw in the wind, Rotary Electric Steel Co., Detroit, currently producing about 22,000 tons of ingots monthly, has discontinued all sales outside the state of Michigan and has closed all sales offices in other territories.

Significant Move—Another significant move of the past week or so reflecting the influence of freight rates on steel distribution, was the suggestion by Carnegie-Illinois Steel Corp. and American Bridge Co., both subsidiaries of U. S. Steel Corp., that eastern railroads reduce freight rates approximately 40 per cent on various iron and steel articles moving from the Pittsburgh district to the New York City and Detroit areas.

Freight Boosts Made Permanent

IRON and steel freight rates will be increased somewhat on long hauls under the recent ruling of the Interstate Commerce Commission, now scheduled to become effective Aug. 21.

Pending further clarification, there is still some divergence of opinion among traffic men as to these long haul freight charges. Some believe present rates of 63 and 64 cents on manufactured iron and steel in eastern territory will be increased 1 cent and that present rates of 65 cents and over will be increased 2 cents. Others believe that the 1 cent increase will affect present rates of 63 to 65 cents and that the 2 cents increase will affect current rates of 66 cents and higher.

However, whatever the adjustment, it is clear the ICC order will not affect current rates of 62 cents and under. Thus, rates in shipment from Pittsburgh, Buffalo and several other leading inland producing centers into the New York district, to say nothing, of course, of rates from producing centers nearer east, will not be altered, although it is pointed out that certain New England consuming points will be hit by higher rates.

Permanent Rates—The new order makes permanent interim increases which became effective Oct. 13, 1947, Jan. 5 and Jan. 13, 1948 and May 6, 1948, but, as indicated, with certain modifications.

Lowering of Rates Unlikely

RECENT proposal of Carnegie-Illinois Steel Corp. and American Bridge Co., subsidiaries of U. S. Steel Corp., that eastern railroads reduce freight rates 40 per cent on steel products shipped from the Pittsburgh district to Detroit and New York appears to have little chance of being adopted.

An unusual feature of the request is that the lower rates would apply on multiple car minimum shipments

of 400,000 pounds, not over 5 cars. For every car over 5 on a specific shipment, an additional 80,000 lb shipped from the Pittsburgh district would be added to the minimum. It is contended such "block" shipments would substantially reduce terminal and intermediate switching costs.

U. S. Steel's request for lower rates to Detroit and New York was prompted by the new competitive situation brought about by adoption of the mill pricing system. Under the multiple basing point system, arbitrary delivered prices were established for the Detroit district which eliminated competitive price and freight advantage of one mill over others. On shipments to New York, eastern steel mills have a substantial freight advantage over distant producing plants, such as at Pittsburgh.

Holds Advantage — Although the Ecorse, Mich., mill has established a price 20 cents per 100 pounds above the general market level for cold-rolled sheets, for instance, it still commands a substantial competitive advantage at Detroit over other mills producing this product at points distant from Detroit when transportation charges are taken into consideration. A 40 per cent reduction in freight rates would place other mills on a more equal footing with the local area producer.

The following tables show the present lowest delivered prices of cold-rolled sheets to Detroit and New York (based on representative freight rates) from selected producing points, compared with prices of the same product from Ecorse, Mich., and Sparrows Point, Md., mills.

Pricing Study To Start

Data collection under way for Senate probe of changes resulting from court decisions

WITH manufacturers increasingly expressing uncertainty as to whether their pricing methods are legal or illegal under recent rulings of the Federal Trade Commission and decisions of the Supreme Court, the Senate Interstate & Foreign Commerce subcommittee headed by Senator Homer E. Capehart (Rep., Ind.) is about to go into high gear in a thorough review of the whole situation.

It wants to report to Congress as early next year as possible, in time to permit remedial legislation if such is found necessary.

Plan Open Hearings—Businessmen will get a chance to state their pricing troubles and uncertainties to the subcommittee in a series of open hearings to start about the middle of November, and to be held not only in Washington but in other cities.

In the meantime the basic groundwork is being laid by the subcommittee's newly engaged general counsel, William Simon, a Chicago lawyer who has had much experience in Sherman antitrust, Federal Trade Commission and Clayton Act matters. Working with him will be Dr. Melvin Thomas Copeland, director of business research for the Harvard School of Business Administration. Dr. Copeland has written extensively on business and economics.

Advisory Council—In addition, the subcommittee will be assisted by an advisory council to consist of 35 members representing "labor, agriculture, buyers and sellers in both heavy and light goods industries" under the chairmanship of Dr. Copeland.

SEN. HOMER E. CAPEHART

Senator Capehart last week called attention to the brief filed by the Federal Trade Commission July 10 in the famous Pittsburgh Plus case against the United States Steel Corp. In it the FTC refused to amend its original cease-and-desist order so as to permit freight absorption to meet a competitor's delivered price. It was his impression that the commissioners, when they recently appeared before his subcommittee, did not hold it illegal to absorb freight in order to meet a competitor's price. This apparent contradiction, the senator said, should be cleared up.

Freight Absorption—"Will the Supreme Court decision make it illegal for a seller to pay any part of the freight charges to the buyers' destination—which he may consider essential to meet competition? Or stated another way, did the court outlaw a universal delivered price by a manufacturer? Is it illegal for a candy bar manufacturer to sell his product so that it will retail throughout the United States for a nickel a package? Or should the candy bars sell at varying prices according to freight charges? Will the Supreme Court decision help or cripple small business? Will the evils of monopoly be aided or impeded?

"These are some of the questions which our subcommittee proposes to study. What we're after is to find out what pricing policies will best serve the competitive forces of free enterprise and the economic stability of the nation.

"Another thing," added Senator Capehart, "is that while under the FTC orders and the court decision

COMPARATIVE PRICES ON COLD-ROLLED SHEETS SHIPPED TO DETROIT

(Dollars per 100 lbs)

	Mill Price	Representative Freight Rate to Detroit (including 3% tax)	Resulting Delivered Price to Detroit User	Ecorse, Mich., Mill Price plus Representative Detroit Switching Charge	Ecorse Mill's Freight Advantage at Detroit
Pittsburgh	$4.00	$0.4738	$4.4738	$4.2368	$0.2370
Chicago	4.00	0.4532	4.4532	4.2368	0.2164
Follansbee, W. Va.	4.00	0.4326	4.4326	4.2368	0.1958
Weirton, W. Va.	4.00	0.4326	4.4326	4.2368	0.1958
Steubenville, O.	4.00	0.4326	4.4326	4.2368	0.1958
Lackawanna, N. Y.	4.00	0.4120	4.4120	4.2368	0.1752
Middletown, O.	4.00	0.4017	4.4017	4.2368	0.1649
Cleveland	4.00	0.3502	4.3502	4.2368	0.1134

COMPARATIVE PRICES ON COLD-ROLLED SHEETS SHIPPED TO NEW YORK

(Dollars per 100 lbs)

	Mill Price	Representative Freight Rate to New York (Including 3% tax)	Resulting Delivered Price to New York Buyer	Sparrows Point Mill Price plus Freight to New York	Sparrows Point Mill's Freight Advantage at New York
Pittsburgh	$4.00	$0.5768	$4.5768	$4.3914	$0.1854
Chicago	4.00	0.7828	4.7828	4.3914	0.3914
Follansbee, W. Va.	4.00	0.5768	4.5768	4.3914	0.1854
Weirton, W. Va.	4.00	0.5768	4.5768	4.3914	0.1854
Steubenville, O.	4.00	0.5459	4.5459	4.3914	0.1545
Lackawanna, N. Y.	4.00	0.5459	4.5459	4.3914	0.1545
Middletown, O.	4.00	0.6902	4.6902	4.3914	0.3088
Cleveland, O.	4.00	0.6489	4.6489	4.3914	0.2575

many manufacturers think they must locate their plants close to their steel suppliers, the National Security Resources Board has embarked on a course of persuading industry to disperse itself throughout the country. On the one hand we seem to have created an economic need toward greater concentration of industry while on the other we have a national defense need to disperse industry. If dispersion is necessary," said Senator Capehart, "then Congress ought to remove any economic barriers that now stand in the way due to Federal Trade Commission rulings and Supreme Court decisions."

Steel Distribution Studied

THOSE small steel consumers whose plant locations have been placed at a freight rate disadvantage as result of the new policy under which steel is being sold on an f.o.b. mill basis plus full freight to destination are invited to inform the Senate Small Business Committee with respect to their troubles.

While this committee does not intend to conduct any full-fledged investigation of the situation resulting from abandonment of the multiple-basing-point-delivered-price system by the steel industry, it will examine thoroughly into cases where small consumers' competitive situation has been injured as a result.

The committee continues with its investigation of the present volume of steel shipments into certain middle western alleged "steel-starved" states as compared with shipments to those states in 1947 and earlier years. The aim is to determine to what extent consumers in these states are being deprived of their fair share of current steel production.

The committee also has launched a study of steel distribution from warehouses to determine whether an undue proportion of warehouse steel currently is going to large consumers at the expense of small consumers.

Youngstown 'Welcome' Mat

YOUNGSTOWN Sheet & Tube Co., situated in a steel-exporting region, is making plans to hedge against possible effects of the steel industry's shift to mill pricing and has established an Industrial Development Division.

Purpose of this division is to contact consumers of steel, particularly customers of Youngstown, who desire to investigate the possibilities of locating in the Youngstown area. Myron S. Curtis, sales promotion manager, is in charge of the division.

No Full-Scale Probe of Steel Price Rises

House Banking Committee chairman says any questioning of steel industry by his group will be only incidental to hearings on Presidents' anti-inflation program

A FULL SCALE investigation of recent steel price increases will not emerge from the House Banking Committee's hearings on President Truman's anti-inflation program.

That statement came from Rep. Jesse P. Wolcott (Rep., Mich.), chairman of that committee, after Rep. Brent Spence (Dem., Ky.), a member of the committee, demanded a probe of steel price advances.

However, Mr. Wolcott said his group might call on United States Steel Corp. to explain the recent increase. He pointed out the price boost may have been justified by wage raises which preceded the price increases.

He also suggested that steel price advances might be justified if they were made in anticipation of expanding production.

However, it was his belief none of the committee knew enough about the situation to say whether the latest increase in steel prices was justified. He felt the committee should not close the door to any testimony that would throw light on the inflation problem, and therefore might call in U. S. Steel officials.

Mr. Spence said he thought that if the committee were searching for the cause of high prices it should have U. S. Steel officials appear before it. Rep. Frederick C. Smith (Rep., O.) said he wouldn't object to hearing industry witnesses but emphasized "we ought to be careful and not try to make a scapegoat out of industry." He argued that the sole cause of high prices has been policies pursued by the U. S. government during the last 15 years.

See Hope of Halting Inflation

INFLATIONARY forces have proved too strong to be contained by voluntary action of industry, labor and the consumer.

That's the conclusion of President Truman's Council of Economic Advisers in its semiannual report. However, it refrains from any outright endorsement of the President's effort to gain new legislative authority to combat price trends, although it does say the government should have and use powers to supplement the strength of individual actions.

The report emphasizes that the presence of inflationary forces does not mean the nation is necessarily on the threshold of runaway price rises. It points out high crop yields and increased industrial expansion should work strongly against further inflation.

In similar vein, a study just completed by the National Bureau of Economic Research says that unless rising costs and pressures of renewed demand superimpose a further major inflationary advance on the price rise of the last nine years "there is hope that the needed and inevitable internal readjustment of prices may be effected less painfully than it was in 1920-21." Dr. Frederick C. Mills, author of the study, points out that not all the changes in price relations in the United States since 1939 will necessarily be reversed in the years ahead. Some may have accompanied enduring alterations in underlying conditions, he says.

To Save on Finished Goods

RAILROAD freight rates on finished products rather than on raw materials are reported to be the principal factors that influenced Kelsey-Hayes Wheel Co., Detroit, to purchase a plant recently at McKeesport, Pa.

Although the steel industry's adoption of an f.o.b. mill pricing system is said to be spurring some consumers to move nearer their steel supply source in order to hold down freight costs, it is reported from Detroit that Kelsey-Hayes is establishing an eastern plant merely to get cheaper rates on the small portion of its finished product it sells in the East.

Freight rates on finished products are higher than on raw materials, and in view of that fact the company, it is said, had contemplated establishment of an eastern plant some years before the recent Supreme Court decision which prompted the steel industry to substitute an f.o.b. mill pricing system for its historic multiple basing point pricing method.

Consolidated To Be Dissolved

STOCKHOLDERS of Consolidated Western Steel Corp. meet Aug. 27 to vote on liquidation and dissolution of the company. Sale of the firm's business, plants and facilities to Columbia Steel Co., U. S. Steel Corp.'s West Coast subsidiary, is expected to be completed Aug. 31.

Plant Disposal Pushed

Only seven months remain for War Assets Administration to dispose of last 52 steel facilities

WITH seven months to go before it reaches termination Feb. 28, the War Assets Administration, dollar-wise, has disposed of about 87.5 per cent of the iron and steel plant inventory which the government had built with public funds during World War II.

Of 151 properties in the program, 52 remain to be sold, mostly the smaller plants that are left. Of these 52 plants, 30 have been taken over by their wartime operators on long-term leases, and are in production. Of the remaining 22, most are idle, although several are being operated under socalled "interim leases."

Remarkable Record—The record is remarkable in view of widespread predictions that wartime plants created by the government would be largely scrapped at some future time. Those already sold, those still unsold but disposed of under long-term leases, and those operating under interim leases, are providing useful products and furnishing a large amount of employment.

The plants still owned by the government, although classed as "iron and steel," include other types of facilities, as forge shops, foundries, fluorspar mines, ferrosilicon plants, etc. Most spectacular of the properties remaining unsold are two blast furnaces. In several cases disposal is held up because the government-owned facilities are so badly scrambled up with those of the wartime operations as to create problems.

Plants Listed—The 52 plants still in the possession of the government, identified by the names of the wartime operators, briefly are described as follows:

Albion Malleable Iron Co., Albion, Mich., malleable foundry and machine shop facilities, now under lease to this company.

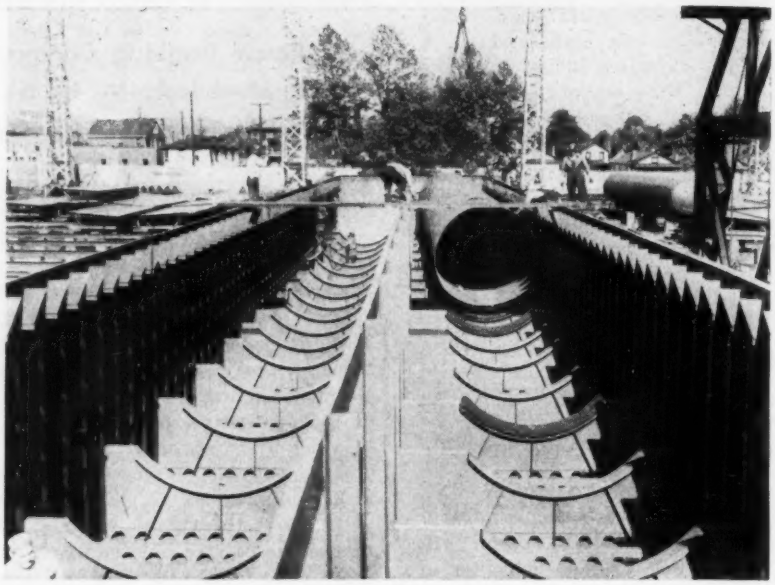
American Steel Foundries Co., Hamilton, O., steel armor casting plant, not now in operation.

Armco Steel Corp., Hamilton, O., iron ore and flue dust sintering plant, now under lease to this company.

Atlantic Steel Castings Co., Crum Lynne, Pa., steel foundry, under interim lease to this company.

Auto Specialties Mfg. Co., Benton Harbor, Mich., steel foundry, under interim lease to this company.

Barium Steel Corp., Canton, O., stainless steel ingot and rough forging production facilities, not now in operation.



SPECIAL JOB, SPECIAL DESIGN: Because it will carry concentrated sulphuric acid, a new barge built by Dravo Corp., Pittsburgh, for use on inland waterways is designed expressly to protect both the cargo and the vessel. Shown during installation are the two cylindrical steel tanks which will carry the acid. For further protection the barge is decked over with steel to make the hold watertight

Buffalo Brake Beam Co., Buffalo, carbon and alloy steel and malleable foundry and hot-dip galvanizing facilities, not now in operation.

Canton Drop Forging & Mfg. Co., Canton, O., forge and machine shop facilities, now under lease to this company.

Champion Machine & Forging Co., Cleveland, aircraft and aircraft engine forging facilities, under interim lease to this company.

Columbia Steel Co., Pittsburg, Calif., open-hearth and electric steel foundry, now under interim lease to this company.

Continental Foundry & Machine Co., two steel foundries at Coraopolis, Pa., and East Chicago, Ind., neither in operation.

Copperweld Steel Co., Warren, O., scrambled steelmaking facilities.

Crucible Steel Castings Co., Milwaukee, electric steel foundry, now under lease to this company.

Armor Plate Plant, Gary, Ind., in process of being returned to Army Ordnance.

General Metals Co., Oakland, Calif., steel foundry, now under lease to this company.

Granite City Steel Co., Granite City, Ill., open-hearth steel plant facilities, now under lease to this company.

Hercules Mfg. Co., Centerville, Ia., steel foundry, now under lease to this company.

Jessop Steel Co., Washington, Pa., electric furnace plant for producing high-speed tool steel, propeller blade steel, etc., now under lease to this company.

Key Co., East St. Louis, Ill., steel foundry, not in operation.

Kropp Forge Co., Chicago, shop for producing aircraft forgings. WAA is considering company's offer of $755,000 for this plant.

Lehigh Foundries Inc., Easton, Pa.,

SEEK INGOT CAPACITY

TO PUT themselves in sounder position to get needed steel, several large consumers have approached the War Assets Administration to examine the prospects for acquiring a surplus government-owned steel foundry either by lease or purchase. Their idea is to produce ingots which would be shipped to rolling mills for conversion into a number of products, mainly sheets and plates.

The difficulty of obtaining both scrap and pig iron is understood to have been the main obstacle to putting one or more of these deals through.

The WAA has seven casting plants which are idle and entirely surplus, and it has four others which are being run by their wartime operators on a short-term interim lease basis.

steel foundry, now under lease to this company.

National Erie Corp., Erie, Pa., steel foundry, now under interim lease to this company.

National Lead Co., Tahawus, N. Y., sintering plant, now under lease to this company.

Ohio Steel Foundry Co., Lima, O., two steel foundries, one now under lease to this company and the other not in operation.

Pacific Car & Foundry Co., Renton, Wash., steel casting testing equipment, not now in use.

Pacific Chain & Mfg. Co., Portland, Oreg., facilities for forging chains for ships, now under lease to this company.

Pittsburgh, Coke & Chemical Co., Pittsburgh, coke oven and gas plant facilities, now under lease to this company.

Republic Steel Corp., blast furnace and coke ovens at Cleveland, now under negotiation; coal washing plant at Bessemer, Ala., now under lease to this company; blast furnace and scrambled facilities at Gadsden, Ala., now under lease to this company; experimental sponge iron plant at Warren, O., not in operation; iron ore sintering plants at Warren and Youngstown, O., now under lease to this company.

Rotary Electric Steel Co., Detroit, scrambled electric steel production not in operation.

Scullin Steel Co., St. Louis, two steel foundries, part of one now under lease to this company and remainder of the facilities not in operation.

Sheffield Steel Corp., open-hearth ingot and shell plants at Houston, Tex., and iron ore mines at Jacksonville and Linden, Tex., all now under lease to this company.

Unicast Corp., Toledo, O., steel foundry, now under lease to this company.

United Engineering & Foundry Co., New Castle, Pa., steel foundry, now under lease to this company.

Utica Drop Forge & Tool Co., Utica, N. Y., facilities for producing forgings for jet propulsion engines and gas turbines, now under lease to this company.

Wenatchee Alloys Inc., Rock Island, Wash., plant for producing ferrosilicon, not now in operation.

Wilkeson Products Corp., coal-mine at Wilkeson, Wash., and coke ovens at Tacoma, not now in operation.

Alan Wood Steel Co., iron ore mine at Ringwood, N. J., not now in operation.

Zuni Milling Co., Los Lunas, New Mex., fluorspar mine, now under lease to this company.

No Scrap Stockpiles Seen Now

NATIONAL Security Resources Board will not at the present time stockpile iron and steel scrap if it follows the advice of R. J. Wysor, special assistant to Board Chairman Arthur M. Hill. Mr. Wysor has just completed a study of the problem.

Although scrap is one of the most important strategic materials, Mr. Wysor advances the following reasons why it should not be stockpiled now:

1. A stockpiling program would take precious scrap from the market, hindering steel production and complicating the already difficult scrap supply situation.

2. Scrap is largely a domestic resource; the supply would not be cut off in case of war.

3. At present prices the cost of stockpiling program would be staggering. Minimum total cost for material alone would be $520 million, figuring that 13 million tons would be needed at an average price of $40 per ton.

Steel Shipments at New High

SHIPMENTS of finished steel products in the first six months exceeded any half year in war or peace, according to American Iron & Steel Institute. Shipments in the period were over 32,250,000 net tons, exceeding the record set in the last half of 1947 by nearly 371,000 tons, and exceeding tonnage shipped in the first half of 1947 by more than 1 million tons. Wartime record was established in first half of 1944 at 31,766,000 tons.

If shipments continue at the current rate, total shipments for the year will approximate 64,500,000 tons, compared with previous record of 63,250,000 tons in 1944. Shipments of sheets and pipe were chiefly responsible for the substantial gain over the first half of 1947. Cold-rolled sheets registered the largest single tonnage increase and constituted 10.2 per cent of shipments, compared with 8.6 per cent a year earlier. Hot-rolled sheets and tin plate also showed substantial gains.

Six Months' Iron Output Off

PIG IRON output during the first half of this year dropped 518,784 tons under the total for the like 1947 period, due entirely to the effects of the April coal strike on operations.

Blast furnaces have maintained a high rate of production following resumption of active operations in May. Production of pig iron, ferromanganese and spiegeleisen totaled 4,990,501 tons in June compared with 5,077,168 tons in May and 4,809,809 tons in June, 1947. This brought the total for the first six months to 28,961,544 tons compared with 29,480,328 tons in the like 1947 period.

Production of steel ingots during the first six months totaled 43,067,278 tons, as adjusted, including 4,099,314 tons of alloy steel and 5,524,095 tons of hot-topped carbon ingots.

Distribution of the first six months' production by districts was as follows: Pittsburgh-Youngstown, 17,391,819 tons; Chicago, 9,435,462 tons; Eastern, 8,220,556 tons; Cleveland-Detroit, 3,686,252 tons; Western, 2,280,046 tons; and Southern, 2,053,143 tons. The industry operated at 93.8 per cent of capacity in June and 91.9 per cent during the first six months.

PIG IRON AND FERROALLOY PRODUCTION FOR JUNE AND YEAR TO DATE

Blast Furnace Capacity and Production—Net Tons — JUNE - 1948

	Number of companies	Annual blast furnace capacity	Production							
			Pig Iron		Ferro Manganese and Spiegel		Total		Percent of capacity	
			Current month	Year to date	Current Month	Year to date	Current month	Year to date	Current month	Year to date
Distribution by Districts:										
Eastern	11	13,093,560	891,517	5,231,111	33,125	163,969	924,642	5,395,080	86.1	82.8
Pittsburgh-Youngstown	17	23,588,120	1,954,588	11,249,018	18,311	136,586	1,972,899	11,385,604	94.0	89.4
Cleveland-Detroit	6	6,495,000	481,783	2,896,361	-	-	481,783	2,896,361	90.4	89.6
Chicago	7	14,700,290	1,015,189	5,952,304	5,096	5,096	1,020,285	5,957,400	84.6	81.5
Southern	8	4,949,660	379,429	2,159,015	8,667	48,106	388,096	2,207,121	95.6	89.6
Western	3	2,612,300	202,796	1,119,978	-	-	202,796	1,119,978	94.6	86.2
Total	35	67,438,930	4,925,302	28,607,787	65,199	353,757	4,990,501	28,961,544	90.2	86.3

Steel Market Still Expands on Coast

Construction of new pipeline projects in area reflects continued population growth. Survey shows San Francisco Bay district's advance in manufacturing plants in 1947

EXPANDING market for steel products on the West Coast, fostered by the continuing migration of population, is still growing by leaps and bounds.

Evidence of the trend was reiterated recently when plans were announced for construction of another natural gas pipeline from Texas to California. The line will stretch 1637 miles in all, and construction will require more than 500,000 tons of steel pipe in 30 and 26-in. diameters.

This project, and its resultant demand for steel, is a direct reflection of California's industrial and population growth which has increased so greatly and so rapidly that closer-to-home fuel supplies are insufficient for all needs.

Study Prepared—This trend is further shown in a study prepared by the Department of Commerce field service, in San Francisco.

This survey, based on employment trends, shows the San Francisco Bay area last year made a bigger advance in the number of new manufacturing plants than either California or the nation. The report also shows that a greater portion of the new plants are in the durable goods field than in non-durable lines. The San Francisco area added 13.8 per cent to employment in durable goods plants, the study points out, compared with 7 per cent for California as a whole and 11.7 per cent in the nation.

Before the war, the San Francisco area's employment in non-durable fields outweighed that in durable goods manufacturing plants, but during wartime the emphasis shifted to the latter. After the war a trend toward non-durable fields resumed, but in 1946 durable lines again started mounting and the proportion has grown ever since.

Sees Many Opportunities—Industries which have contributed most heavily to this shift have been those producing machinery and furniture.

The Department of Commerce survey concludes that "many opportunities still exist for successful location of additional factories in the area." Further expansion of plants plus continued inflow of population from other areas indicate the western growth is far from halted.

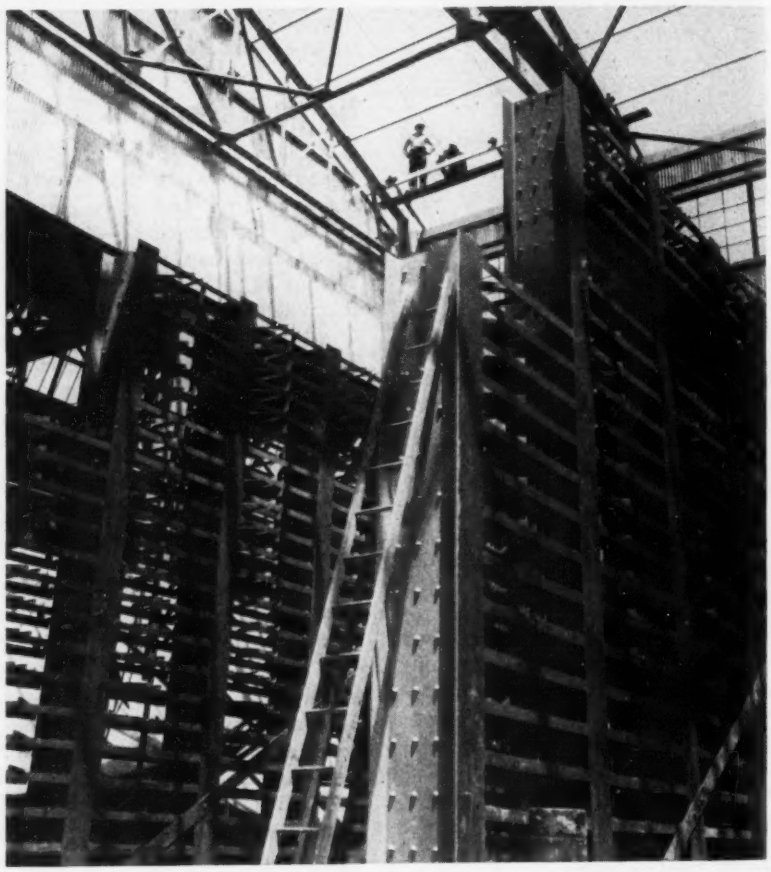
And as population and industry expand it appears certain that new demands will be made for fuel supplies and additional pipelines such as the one just announced.

The pipeline project will be a joint venture of Pacific Gas & Electric Co. and the El Paso Gas Co.

Pacific Gas & Electric plans to build 510 miles of 30-in. line from Needles, Calif., near the Arizona border, to a point near San Francisco. The line is expected to be completed by Jan. 1, 1951, and will cost about $45 million.

Line Proposed—El Paso Gas Co. and its subsidiary, San Juan Pipeline Co., will build 1127 miles of line at a cost of $100 million. One of the Texas lines will stretch 628 miles from the Permian Basin in Texas; it will be 30-in. diameter pipe. The other will be 499 miles of 26-in. pipe from San Juan Basin to Needles where the two lines will connect with the Pacific Gas line.

Construction of the new lines will begin as soon as permits are obtained and pipe is available.



NEW SOURCE OF WIRE: All steelwork is in place in the wire rod storage building of Bethlehem Pacific Coast Steel Corp.'s new wire mill. Storage racks at the right have capacity of 2000 tons of coiled rods. First wire will come from the $2 million mill this summer

Steel Export Quotas Set

QUOTAS of iron and steel products that may be shipped from the United States to foreign countries in the third quarter of 1948 have been established.

Of the 1,120,000 tons for which third-quarter quotas have been set up, 835,000 tons are for commercial licensing and 285,000 tons are for special projects, the Office of International Trade reports. The latter figure is 57,000 tons greater than the second-quarter figure because many of these projects are producing highly critical and strategic materials.

A reduction in the undistributed reserves in the third quarter allows an increase in the tonnage of products to be distributed in country quotas.

Expects Prices To Hold

Bethlehem's chairman sees no further important advance in steel unless costs run away

FURTHER important advances in steel prices in the near future are not anticipated by Eugene G. Grace, chairman, Bethlehem Steel Corp. However, he warns that if costs continue to rise steel prices also will rise.

Profits of his company, and of the steel industry as a whole, he says, are still inadequate considering operating and raw materials costs, taxes, and depreciation in the value of the dollar, as compared with several years ago. Investment replacement costs are two and three times as high as they were in normal prewar years, he points out.

Notwithstanding record-breaking demands for steel, the price of steel, he says, lags far behind the costs of many raw materials important in steel production. He points out that Bethlehem's prices for steel, and he believes the figure is fairly representative of the entire steel industry, have advanced 67 per cent since 1939. This, he emphasizes, takes into account not only changes in base prices, but extras and all else that may have contributed to Bethlehem's return from the sale of its steel; it also includes, of course, the latest general adjustment in steel prices.

Costs Up Sharply—The figure of 67 per cent, he points out, compares with an increase of 193 per cent for fuel oil during that period, 130 per cent for coal, 194 per cent for scrap, 144 per cent for coke, 354 per cent for lead, 120 per cent for tin and 212 per cent for zinc. Labor earnings in that period increased 101 per cent, he adds.

Mr. Grace, speaking at a press conference which followed the corporation's last quarterly meeting, said the return on sales in the second quarter amounts to 5 per cent and on investment, 8.4 per cent. For the corresponding period of last year, the returns were 4.7 per cent and 7.2 per cent, respectively. For the first half of the year they were 5.1 per cent and 8.6 per cent, against 5.7 per cent and 8.3 per cent in the first six months of 1947. Under existing conditions, he said, these returns are not adequate, and he stressed the importance of being able not only to maintain fair returns to stockholders, but to set aside for company development.

Revises Prices Downward — Commenting on Bethlehem's recent downward revision in the prices of a selected list of steel products, he remarked that the changes were made after the company had a chance to analyze prices of leading competitors, especially as they applied in certain districts. As an example, he cited the case of bars at Buffalo, which Bethlehem marked down $1 a ton. At that point, he said, they found they were quoting $1 higher than the new mill price established there by Republic Steel Corp. With a large mill at Lackawanna, Bethlehem, he explained, simply "couldn't afford to have an important competitor in its own back yard quoting $1 a ton under it."

Boost in Steel Dividends Lags

IRON and steel industry dividends in 1947, at approximately $193,900,000, were 34 per cent higher than in 1940, while average hourly earnings of steel production workers rose 78 per cent, according to the American Iron & Steel Institute.

Stockholders received only 43 per cent of the 1947 profits, compared with 49 per cent in 1940 and with 66 per cent in the "twenties." Federal income taxes in 1947 were nearly $300 million, or approximately half again as large as dividends. In addition, federal income tax payments exceeded the portion of earnings retained by the industry.

Tube Mill Begins Operations

OPERATIONS of the modernized No. 2 seamless tube mill of National Tube Co., in Gary, Ind., began on Aug. 2. For a shakedown period of approximately 30 days the mill will be operated on a one-turn basis and then gradually stepped up to full production. Mill will be able to turn out tubes from 3 to 9 inches in outside diameter and up to 45 ft long, and will specialize in alloy, stainless and carbon tubing.

Huge new "doughnut-type" rotary heating furnace and a new 13-unit reheating furnace will serve the mill. Circular kiln of the heating furnace has an outside diameter of 61 feet and an inside radius of 19 feet. Temperatures in each heating zone can be controlled independently of the others.

Alloy Steel Output Gains

PRODUCTION of alloy steel in the first half of 1948 increased 7.7 per cent over the like period in 1947, while the total output of steel, retarded by the spring walkout of coal miners, increased 1.7 per cent, according to American Iron & Steel Institute.

Output of alloy ingots and steel for castings was 4,099,314 net tons in the half year, of which 995,686 tons were produced in electric furnaces and the balance in open hearths. The gain in electric furnace alloys was 3.1 per cent, while the gain in open hearth alloys was 9.3 per cent.

Total production of ingots and steel for castings in the six months was 43,067,278 tons, nearly 729,000 tons larger than in the first half of 1947.

Calendar of Meetings . . .

Aug. 10-13, First Western Packaging Exposition and Conference: San Francisco Civic Auditorium, San Francisco.

Aug. 24-27, American Institute of Electrical Engineers: Pacific general meeting, Spokane, Wash. Institute headquarters are at 33 W. 39th St., New York.

Aug. 30-Sept. 3, American Chemical Society: Eastern section of annual meeting, Washington, D. C. Society headquarters are at 60 E. 42nd St., New York.

Sept. 6-10, American Chemical Society: Midwest section of annual meeting, St. Louis. Society headquarters are at 60 E. 42nd St., New York.

Sept. 7-20, Department of State: First inter-American conference on conservation of renewable natural resources, Denver.

Sept. 9-10, American Ceramic Society: Fall meeting, Hotel Conneaut, Conneaut Lake Park, Pa. Society headquarters are at 2525 N. High St., Columbus, O.

Sept. 13-17, American Chemical Society: Western section of annual meeting, Portland, Oreg. Society headquarters are at 60 E. 42nd St., New York.

Sept. 13-17, Instrument Society of America: Third instrument conference and exhibit, Convention Hall, Philadelphia. Society headquarters are at 1117 Wolfendale St., Pittsburgh.

Sept. 20-25, American Mining Congress: Metal mining convention and exposition, San Francisco. Congress headquarters are in the Ring Bldg., Washington.

Sept. 23, American Iron & Steel Institute: Regional technical meeting, Hotel William Penn, Pittsburgh.

Sept. 27-Oct. 2, Society of the Plastics Industry: Third national plastics exposition, Grand Central Palace, New York. Society headquarters are at 295 Madison Ave., New York.

Sept. 28-Oct. 1, Association of Iron & Steel Engineers: Annual convention and exhibition, Public Auditorium, Cleveland. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Sept. 29, American Iron & Steel Institute: Regional technical meeting, Hotel Cleveland, Cleveland.

Oct. 4-11, American Institute of Steel Construction Inc.: Twenty-sixth annual convention, Chateau Frontenac, Quebec, Canada. Institute headquarters are at 101 Park Ave., New York.

Oct. 5-7, Industrial Packaging Engineers Association: Show at Hotel Sherman, Chicago. Association headquarters are at 20 W. Jackson Blvd., Chicago.

Oct. 6, American Iron & Steel Institute: Regional technical meeting, The Stevens, Chicago.

Oct. 11-13, American Society of Tool Engineers: Semi-annual convention, Biltmore Hotel, Los Angeles. Society executive secretary is Harry E. Conrad, 1666 Penobscot Bldg., Detroit.

Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

Anti-inflation debate watched closely by political observers for clew to election results. President's program appears more readily grasped by man on street than G.O.P. stand

DESPITE confident expressions of their leaders, many Republican members of Congress have developed the jitters as result of President Truman's call upon the special session of Congress to give him price control and rationing powers and to pass the Taft-Ellender-Wagner housing bill.

On the one hand, newspapers generally, even those aligned on the Republican side, have been emphasizing the hostile attitude of Congress toward the President's demands. On the other, there is considerable evidence that the President has gained popularity in his role of the people's champion against the rising cost of living. In addition, many Congressmen from areas where the labor unions have big followings are worried about the flat demand in the Democratic platform for repeal of the Taft-Hartley Act.

Evaluating Factors—Political wiseacres in Washington who make a business of forecasting election results are trying to evaluate these factors in terms of the result next November. While all agree President Truman personally stands no chance of re-election, they think his anti-inflation fight and his attempt to get the housing bill through in the name of the veterans, combined with the Taft-Hartley repealer plank, may serve to prevent any great gain in the Republican majority in the 81st Congress.

In particular, four or five Republican senators seeking re-election now are given no better than an even chance of winning through. Observers point out that splitting off of the Southern so-called "splinter" party will make no dent in the ranks of Democratic congressmen from the South.

Easily Grasped— From a popular point of view, the President has advanced a program which is easily grasped. He wants power to effect price ceilings or rollbacks on such products as fluid milk and other dairy products, meat, steel, nonferrous metals, building materials and a number of other commodities. Opposed to this specific program, the Republican argument is one that is less easily understood by the man on the street, and even leads to sharp controversy among professional economists and fiscal experts.

In brief, the Republican position, as outlined by studious Rep. Jesse P. Wolcott (Rep., Mich.) who, as chairman of the House Banking & Currency Committee, master-minded much of the pertinent legislation in the 80th Congress, is as follows:

The President, by invoking a national economic or other emergency, can, under Public Law 386 (80th Congress), fight inflation by tightening up on the money supply. He can raise bank reserve requirements to any level he chooses, he can raise the rediscount rate, and he can place curbs on consumers' installment credit.

Can Discourage Inflation—He can discourage inflation by lowering the support price the government will pay for government bonds, continued Mr. Wolcott. He can exercise powers under the Export Control Act to reduce our exports sharply. He can insist on devaluation of the pound sterling and certain other currencies, after the example of Italy and France, to prevent needless bidding up of our domestic prices as a result of export buying.

Mr. Wolcott also, even before delivery of the President's economic report with its warning of the inflationary consequences resulting from the granting of excess housing credit, took the position that enactment of the Taft-Ellender-Wagner housing bill would promote inflation under present conditions.

Mr. Wolcott went on to declare that the President "could right now tighten the money supply to a point even where nobody could borrow a nickel at a bank."

These remarks were made by Mr. Wolcott while Paul Porter appeared before his committee to present the President's anti-inflation bill, and what he said on that occasion sums up pretty well what the Republican leadership has said in response to the President's request for anti-inflation curbs. The Republican position is considered entirely sound—but it is unfortunate that it has not been explained in greater detail—as, for example, the extent to which it would be safe to raise bank reserve requirements without endangering economic stability, and the extent to which we should reduce our exports as a factor in our foreign policy.

Many observers believe that while the President's call for anti-inflation weapons was primarily a political gesture, his speech to Congress constituted a major public relations job for the Democratic party—and that it will provide a first-class issue for Democrats running for election to Congress this year.

PROFITABLE HOUSING

Shock was given Washington last week when the Defense Homes Corp. after terminating its operation on July 30 announced it had earned a net profit of about $2,100,000 for the government.

Created in 1940 to provide housing for defense plant workers, the corporation built and operated 10,964 housing units ranging from individual homes to an apartment hotel. All this housing now has been disposed of, mainly by sale to private purchasers.

Patent Regulations Revised

FIRST major revision of the patent rules and regulations since they were originated in embryo form in 1836 has been completed by the Patent Office and copies of the "Proposed Revision of Patent Rules" may be obtained from the Commissioner of Patents, Washington 25, D. C.

Criticisms and suggestions are invited, to be submitted in written form prior to Sept. 25, 1948, or orally at hearings to start Sept. 27 in the Commerce Building Auditorium.

The major change, which is expected to result in considerable controversy at the hearings, is a new rule outlawing "the use of display advertising, circulars, letters, cards and similar material, to solicit patent business." Such advertising for business is labeled as "unprofessional conduct."

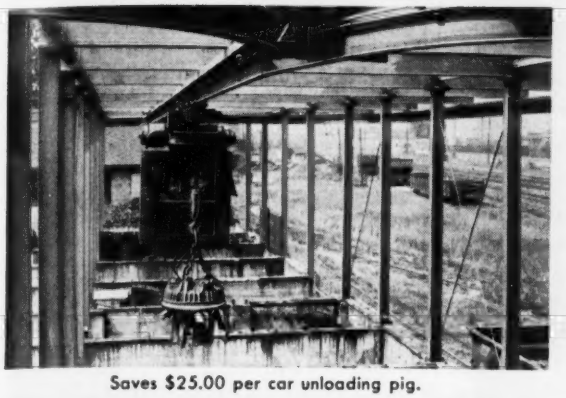
The rule springs from exorbitant charges which have been levied against inexperienced inventors after they have gotten into the toils of certain patent law firms which solicit business by display advertising.

FTC Studies Mergers, Markets

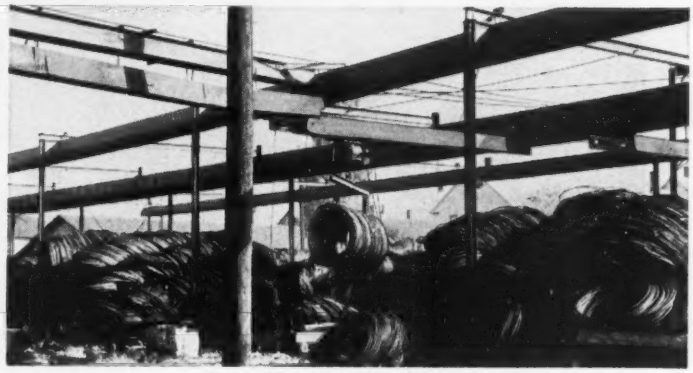
PROBLEM of distribution, major headache in the metalworking indus-

MOVE HEAVY LOADS ON MONORAIL

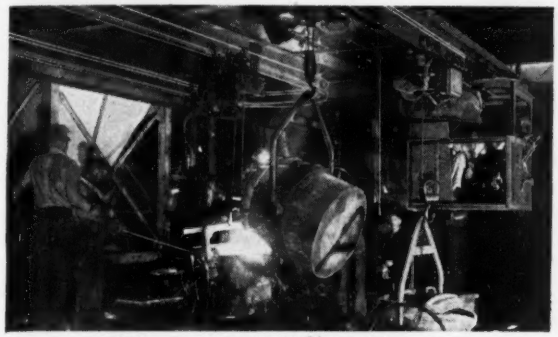
FOR LOWER COST HANDLING



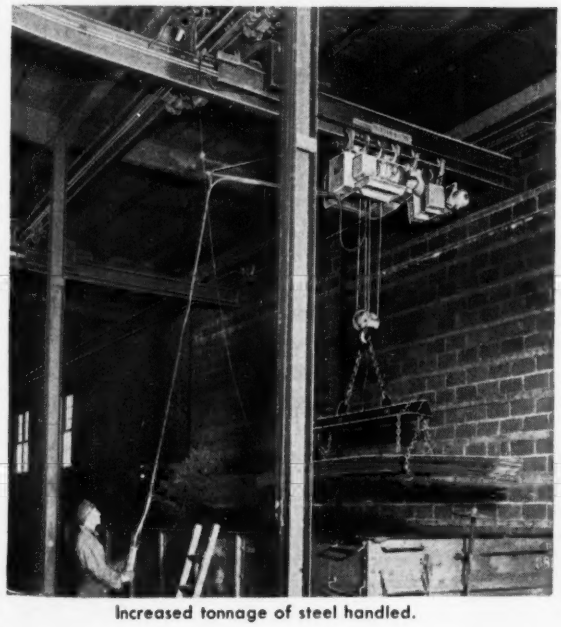
Saves $25.00 per car unloading pig.



Saves 32c per ton handling rod.



Delivers metal with 60% less labor.



Increased tonnage of steel handled.

Tough jobs to handle are naturals for Mono-Rail. Any American MonoRail system increases plant capacity and production pace, conserves skilled labor, reduces damage and accidents and SAVES YOU MONEY.

Any system, regardless of how complicated, will pay for itself in time and money saved. One company reports a savings of 86% in handling costs.

Whatever your handling problem may be, there is an American MonoRail system adaptable to it. From the simplest hand-operated unit to the most complicated fully automatic system, American MonoRail engineers can suggest a system best suited to your problem.

SEND FOR BULLETIN C-1. A 56-page book showing successful applications of American Mono-Rail Systems.

THE AMERICAN MONORAIL COMPANY

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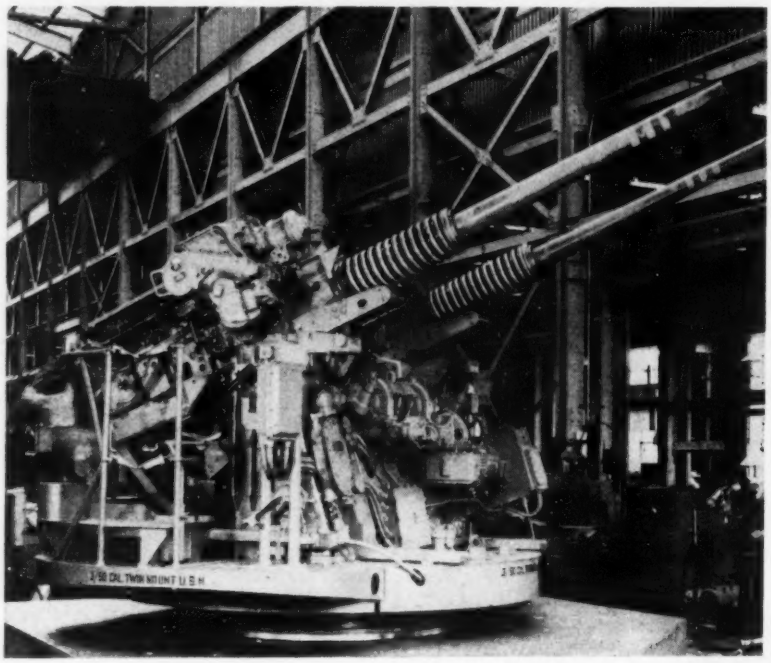

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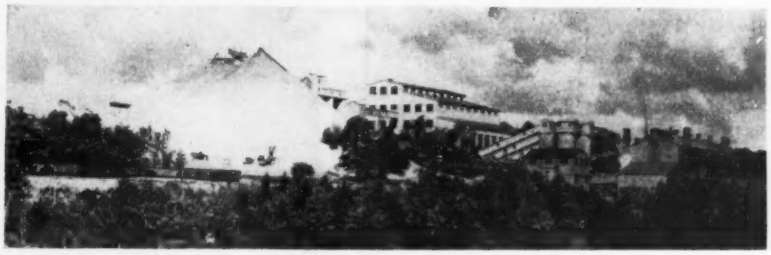

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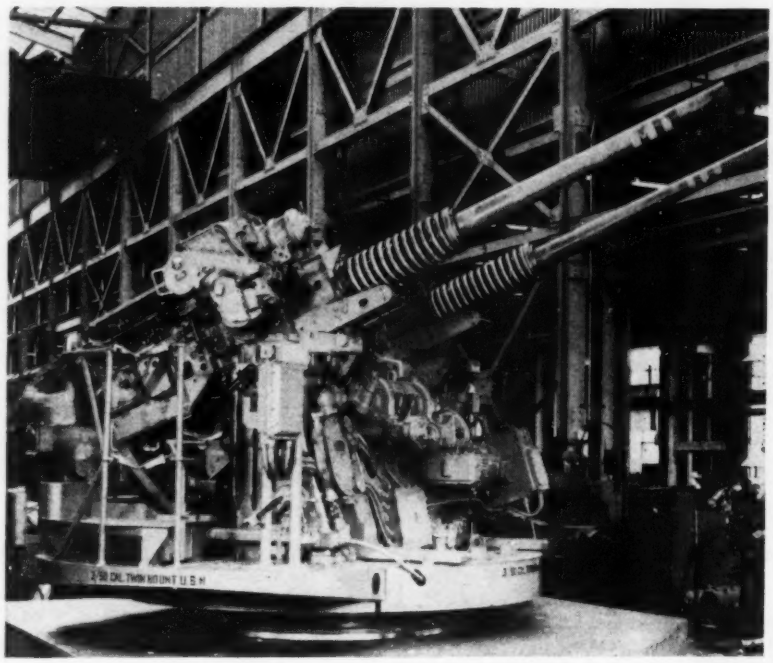

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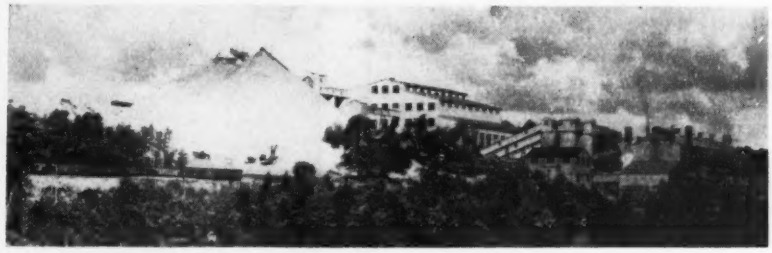

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Steel Lifts French Hopes

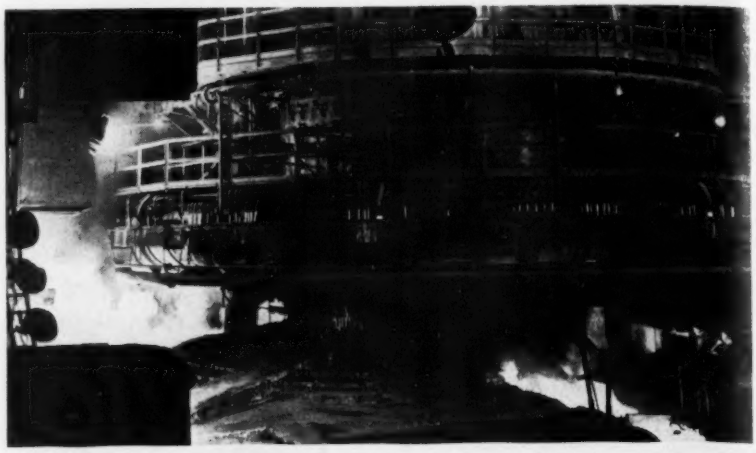
Industry's good showing in recent months seen as portent for eventual industrial recovery

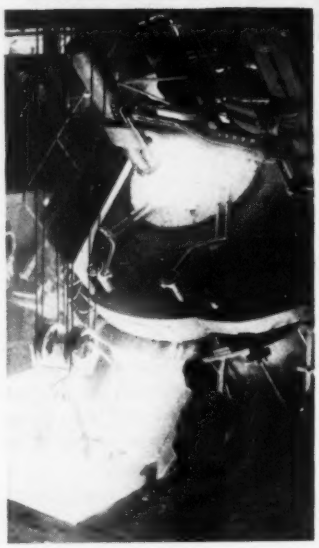
FRENCH hopes for industrial recovery have received a lift from the good showing made recently by the steel industry. Present requirements of all steel products, except sheets and plates, are easily covered by mill production.

As for flat products—strip, plates and sheets—the stringency common all over Europe also prevails in France, a shortage aggravated by the unprecedented domestic consumption which is well over that of 1938. Ambitious expansion plans to increase capacities at the Beautor, de Wendel and Senelle-Maubeuge plants would solve the problem, but none of these projects is very near completion. To maintain production at one of the proposed projects, a continuous cold-rolling mill, France has already begun to send semifinished products to England in exchange for strip coils.

Production Strategy—In another maneuver to maintain production, the French have gone to elaborate lengths to get scarce metallurgical coke. North African scrap will be shipped to Italy, in exchange for which Italy will process coal shipped from the United States. France will get the resulting coke, but Italy will keep the byproducts and gas. From this source, from normal domestic supplies and from successful experiments with Lorraine coal, hitherto not considered of coking grade, the nation will get adequate amounts of this raw material.

Cloud on the horizon, however is the steel export situation. France is just beginning to rebuild many segments of her foreign trade and is finding that steel exports are hampered by shortages and by strong competition from the Benelux nations. As a result, French exports are small, at about 100,000 tons per month. Policy is to spread these shipments as widely as possible to maintain many contacts which may be in the market for increased deliveries in the future.





STEEL FOR EUROPE: Increasing modernization of its steel industry has raised steel output in Great Britain in the last 12 months from an annual rate of 12 million ingot tons to 14½ million. This increase will meet a major part of that country's contribution to European recovery. In top picture from Scunthorpe, England, is a modern blast furnace that produces more pig iron on less fuel. At bottom, left, is electric furnace at Panteg, South Wales, for high quality steel production, while at right is hot steel strip rattling at 30 m.p.h. from finishing rolls and diving into coiling pit in an English steel mill

May Drop Dismantling Plan

GERMAN plant dismantling program, subject of much heated discussion, is proceeding, but the idea of abandoning it in favor of reparations from current production is gaining.

One straw in the wind indicating that such a shift may occur is the negotiations between various British steel firms and Edelstahwerke Erefeld, largest stainless producer of the Ruhr, for the shipment of semifinished crucible steels to England. The plant is on the dismantling list, but thus far no action has been taken.

Another factor which may influence a shift in the dismantling policy is the active resistance of the Germans themselves to the program. Workers of the Hoerde-Steel works at Dortmund refused to obey wrecking orders, forcing the British to postpone plans. The Germans have offered to deliver to the British instead of the dismantled Hoerde plant a new rolling mill which is about 75 per cent finished and which was to have been installed before the war. The argument is that such an arrangement would benefit both parties. The British would get a new mill, rather than an old one, and the Germans would get uninterrupted production from a facility which is now heavily booked with ship plate orders from Holland and Sweden.

All Germans have also withdrawn from the Allied-German Dismantling Commission in the Ruhr. Partly motivating this action was the contemplated dismantling of the wheel works of Bochumer Verein, the only maker of large railroad wheels in Western Germany. One large press at this facility has already been shipped to England, bringing German charges that much such equipment is merely used for scrap, while it could still be used for production in Germany. The company has offered two older plants in exchange for keeping the wheel-manufacturing unit intact.

but the British thus far have refused to bargain.

India Pushes Steel Expansion

GOVERNMENT of India has appointed Koppers Co. Inc., Pittsburgh, as one of its consultants in a project which aims at self-sufficiency in Indian steel production.

Koppers and two others firms with whom similar contracts will be signed soon, Arthur McKee & Co., Cleveland, and International Construction Co., London, are to make surveys of the resources and possibilities in this connection. On the basis of their reports, it will be decided whether to establish one plant of one million tons' capacity or two plants each of half a million tons' capacity.

According to preliminary forecasts by the consultants, work will be completed within five years. Total cost may exceed $150 million if two plants are built. These units would be constructed to allow for future expansion and would consist of complete facilities, including strip, tube and tin plate mills. India needs 2,500,000 tons of steel per year for proper industrial development, according to estimates, but her present production capacity is only about 1,500,000.

Work planned for the consultants is divided into four stages. The first will be the preliminary survey and report on alternative schemes for establishing plants of varying capacities. The second deals with the preparation of designs and specifications. The third will involve purchase of plant units and equipment. The fourth stage will be the supervision and erection of the works.

Government of India, incidentally, has also awarded a contract to Koppers for preparation of a technical report on the possibilities of extracting synthetic oil from coal.

India Boosts Industrial Research

INDIAN Institute of Science at Bangalore has added metallurgy to its research activities. The institute had received a grant of $140,000 from the Government of India, as well as a recurring grant of $4500 to pursue research in this field.

Since 1938 the institute has opened several new departments, including aeronautical engineering, metallurgy, chemical engineering, electro-chemistry and others. Among the 45 research projects currently carried on by the organization are investigations on electric furnace treatment of coal rich in sulphur, production of rubberlined equipment for chemical industries, sulphur deposits, etc.

Facts for Industry . . .

Nonferrous Castings

Shipments of copper and copper-base alloy castings in May at 81 million lb were 9 per cent under April and 10 per cent below May, 1947. Sand castings accounted for 90 per cent of total. Of May shipments, 53 per cent were for the producing companies' own use. Backlog of unfilled orders for commercial castings stood at 66 million lb. Aluminum and aluminum alloy castings shipments were 34 million lb in May, down 12 per cent from April. Of the total, 72 per cent were commercial castings shipments. Backlog at the end of May was 75 million lb. Magnesium castings shipments were 622,000 lb in May, 8 per cent less than in April. Of this total 87 per cent were commercial castings. Backlogs were equivalent to about five months' production. May shipments of zinc and zinc-base alloy castings totaled 35 million lb, a 9 per cent drop from April. Commercial castings amounted to about 68 per cent of the total shipments. Backlog was about 92 million lb. Shipments of lead and lead-base alloy castings were 1.3 million lb in May, a 3 per cent increase over April and 30 per cent higher than in May, 1947. Shipments by captive foundries for their own use accounted for 68 per cent of the total. Backlog of orders for commercial castings represented about one month's production. *Census Bureau, Commerce Dept.*

Oil Burners

Factory shipments of oil burners in May totaled 26,048 units to continue the upward trend begun in the previous month. Although May shipments were 14 per cent over the April total, they were only about one-fourth of May, 1947, shipments. Residential-type burners and burner units accounted for 92 per cent of the total, while industrial and commercial burners and boiler-burner units made up the remainder. Unfilled orders at the end of May amounted to 91,834 units, down 15 per cent from the backlog at the end of April and 90 per cent from orders on hand at the end of May, 1947. *Census Bureau, Commerce Dept.*

Steel Containers

Container production in May amounted to 2 million heavy-type steel barrels and drums, 0.8 million light-type steel barrels and drums, and 4.6 million steel packages, kegs and pails. These figures represented decreases for the second consecutive month for all three types. The decrease from April for heavy types was 12 per cent, light types 4 per cent, and steel packages, kegs and pails 7 per cent. *Census Bureau, Commerce Dept.*

Petroleum

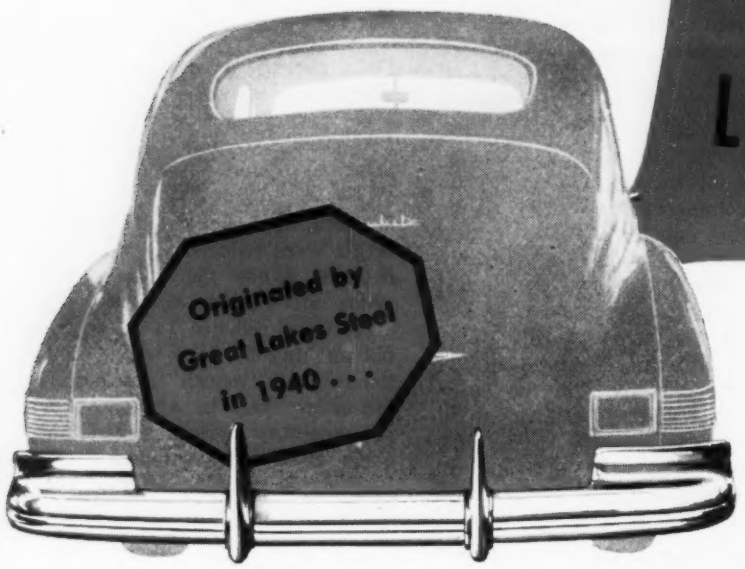
Daily average production of crude petroleum increased 18,000 bbl over April to a new record of 5,502,000 bbl. Demand for domestic crude increased 100,000 bbl daily above the April record to 5,597,000 bbl, and stocks of domestic origin were reduced at an average rate of 95,000 bbl daily. Total crude stocks, domestic and foreign, were reduced to 231,318,000 bbl on May 31. Oil well completions in the month totaled 1864, 148 more than in April. In the January-May period 21 per cent more wells were completed than in the comparable period of 1947. *Bureau of Mines, Interior Dept.*

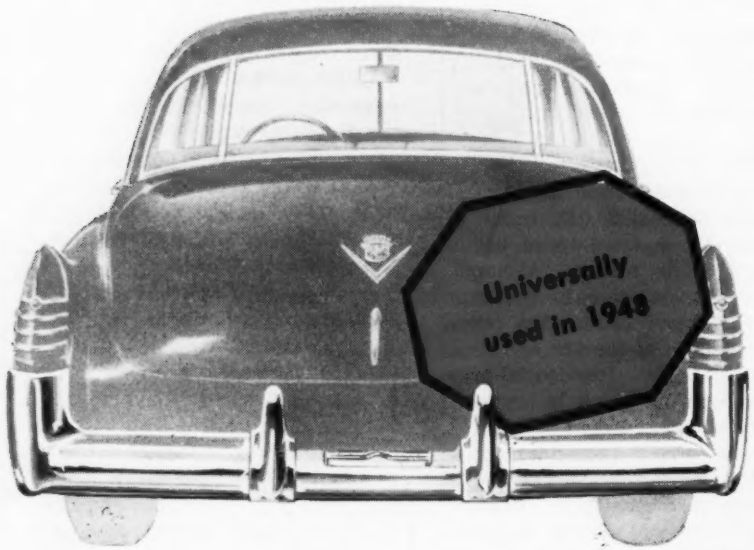
Gray Iron Castings

Gray iron castings shipments during May amounted to 992,692 short tons, 6 per cent below April volume, and for the first time this year were under the one-million ton level. They were 10 per cent lower than in the comparable 1947 year. For the year to date 5.3 million tons have been shipped, slightly under shipments for the five-month period of 1947. Shipments of miscellaneous castings accounted for most of the total decrease in May, the 642,762 tons of these products shipped being 11 per cent under April volume. Shipments of chilled iron railroad car wheels also dropped in May, totaling 60,917 tons from 65,422 tons in April. Shipments of molds for heavy steel ingots advanced to 149,624 tons, an increase of 22 per cent over April. May shipments of cast iron pressure pipe increased slightly to 91,154 tons, while shipments of cast iron soil pipe and fittings dropped to 48,235 tons from April shipments of 49,802 tons. *Census Bureau, Commerce Dept.*

Another First for Great Lakes Steel

Cold-Stamped Bumpers of High-Tensile Low-Alloy Steel





Over eight years ago the Great Lakes Steel Corporation applied N-A-X HIGH-TENSILE STEEL to the first cold-stamped automobile bumper. This represented the first practical application of high-tensile, low-alloy steel to the passenger car industry.

Today, passenger car manufacturers have universally recognized the superiority of cold-stamped bumpers which utilize the high strength, good formability, and better surface texture of high-tensile steel. Four out of five cars built today have them as original equipment – concrete evidence of the economic value of this Great Lakes Steel contribution to the automotive industry.

MAKE A TON OF SHEET STEEL GO FARTHER
Specify–
N-A-X
HIGH-TENSILE STEEL

GREAT LAKES STEEL CORPORATION
N-A-X Alloy Division • Detroit 18, Michigan
UNIT OF NATIONAL STEEL CORPORATION

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

No hint that Federal Trade Commission is probing pricing policy in automotive industry which follows practice somewhat similar to Pittsburgh-Plus banned in steel in 1924

DETROIT

AMID the hue and cry over changed pricing methods on steel, high freight rates and possible relocation of industries, little or no consideration is given to the fact the automobile industry historically has sold its product on what is virtually the same basis as the old Pittsburgh-Plus system in steel, outlawed by the Federal Trade Commission in 1924.

Consequently, even though auto production is dispersed over 113 assembly plants in 77 cities of 24 states, all vehicles are sold at a factory list price plus rail freight from Detroit.

A West Coast buyer of a Chevrolet, for example, pays nearly $300 freight on his car even though it may have been assembled a few miles from his home.

When most automobiles were built in the Detroit area, before the establishment of far-flung assembly plant systems by the large manufacturers, the freight charge was real and not phantom. Now, of course, parts and subassemblies are often shipped across the continent to distant assembly points, although they carry a much lower rate than completed automobiles. Obviously a substantial amount of phantom freight is collected by the motor companies. Even cars shipped from Detroit by haulaway truck are billed at full rail freight on the buyer's invoice.

There is no hint of any FTC probing of this situation and if any were in store it probably would have been started by now. Nonetheless, the parallels between steel and automobile pricing methods are plain enough to cause comment. Possibly it suggests one reason why there have been no loud protests from the motor companies over the higher costs they are now being forced to pay because steel is now being sold f.o.b. shipping point.

Cadillac Pushing Engine Plans

ADDITIONAL information on new passenger car engine programs has come to light in the news that Cadillac is moving ahead on production plans for a valve-in-head V-8 engine, apparently patterned along the lines of the Kettering high-compression type. A two-week closing of the gray iron foundry has been scheduled, with much new equipment to be installed, including jolt-type molding machines to replace former sand slingers. Bore of the new engine is smaller, although horsepower is increased from 150 to 165 by virtue of the higher compression ratio.

It appears the cylinder blocks for the new Oldsmobile high-compression V-8 power plant will be produced by the Central Foundry Division of General Motors at Defiance, O., and purchasing of materials is going forward on this program. The foundry also will supply a number of other smaller parts to various GM Divisions.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1948	1947
January	422,324	366,205
February	399,460	393,636
March	519,133	443,588
April	462,315	445,137
May	359,989	404,191
June	454,388	421,466
6 mos.	2,617,609	2,474,223
July	495,796*	400,944
August		364,478
September		444,501
October		461,536
November		417,493
December		492,109
12 mos.		5,055,284

* Preliminary

Estimates for week ended:

	1948	1947
July 17	120,741	103,091
July 24	118,797	83,867
July 31	113,706	97,712
Aug. 7	95,000	79,452

Estimates by Ward's Automotive Reports

Packard Using Dutch Pig Iron

PACKARD foundry has been receiving pig iron from Holland and has negotiated for additional tonnage from Belgian sources. As might be imagined, the iron is relatively high in cost, being shipped here by rail from an East Coast port. Quality reportedly is inferior, and the imported material is used in small "doses" along with domestic iron.

A new gray iron foundry plant is being built at Sturgis, Mich., to be operated by a former International Harvester executive and producing automotive castings.

"Synchronous Flow" Plant Ready

CHECK for $2500 was formally presented to H. F. Campbell, head of the construction company building the new tractor assembly plant of Harry Ferguson Inc. here, representing a bonus for completing the structure five days ahead of schedule. The so-called "synchronous flow" assembly plant, covering 170,000 sq ft, was completed in 116 working days after breaking ground through a snowfall and 30 in. of frozen earth on Feb. 13. Plans call for four buildings on the property eventually, two of which, the main assembly plant and power house, are now ready and will be followed by an administration building and research laboratory.

The 680-ft assembly building has a single straight-line conveyor system running the full length. Features include floor-level operation for ease in working on assemblies and automatic pickup of tractors from floor-level conveyors to overhead monorails at different points. A "pallet and lift truck" system of storing and moving materials will be used, permitting materials to be stored up to the roof line and making maximum use of plant space. Installation of equipment is proceeding and production will start within 60 days. The program will represent an investment of better than $10 million by Ferguson and his suppliers in production facilities, machinery and equipment.

Continental Engines—The tractor will be powered with Continental engines built at Muskegon, Mich. Other companies supplying components include General Motors, Borg-Warner, Kelsey-Hayes and Bendix Aviation. Ferguson's British affiliate in Coventry, England, now is producing 270 tractors daily, a number of which are being sent to the United States on an interim arrangement until production is started in the Detroit

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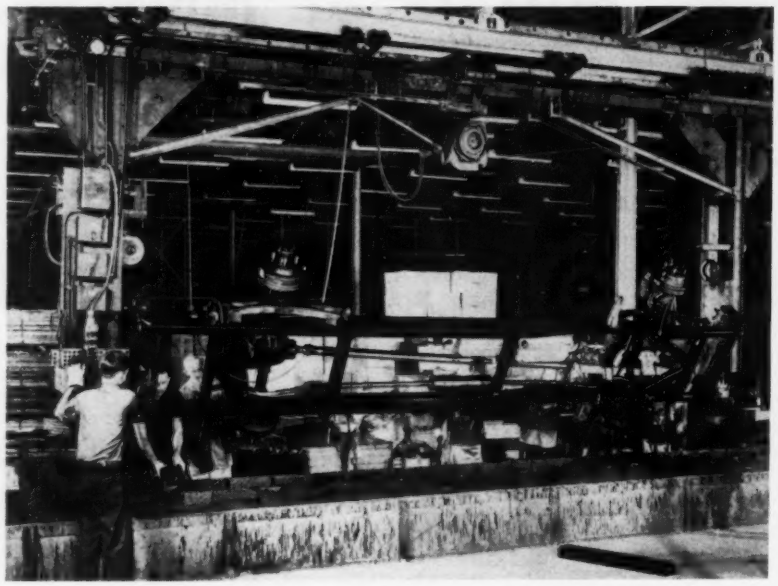


UP AND OVER: A trunnion fixture easily turns frames right side up as they move along chassis assembly line in Studebaker's new truck plant, South Bend, Ind. To this point on the line the frame is upside down to facilitate assembly of axles and drive units. The fixture is moved over the frame, clamped and raised by a central electric hoist, turned over by a motor-driven unit and set back on the conveyor.

plant. Originally, it will be recalled, these tractors were manufactured by Ford on a so-called "handshake agreement" between Mr. Ferguson and the late Henry Ford. This arrangement was terminated last July and Ferguson is suing the Ford Motor Co. and its tractor affiliate, Dearborn Motors Corp., for $251 million, charging patent infringement.

Ferguson will be faced with the problem of setting up a new sales and distributing organization, since this went along with Dearborn Motors. He sees no difficulties on this score, however, and looks forward confidently to the day when Detroit will be the tractor capital of the world. Obviously much rests on the settlement of his suit against Ford.

Solar Roof—Novel features of the Ferguson assembly building include a specially designed solar roof with a series of nine light wells which provide the inside with uniform intensity daylight over the entire floor area. Roof is constructed dead level to retain up to 2 in. of water, evaporation of which is calculated to cool the inside of the building in summer by as much as 10 degrees. In dry periods water can be pumped onto the roof for cooling purposes.

Two-Tone Radiator Ornament

TWO-TONE plating of a zinc die cast radiator ornament for a forthcoming 1949 passenger car model is being carried out on a mass production basis by the Continental Die Casting Division of F. L. Jacobs Co. at Holly, Mich. The ornament comprises a cigar-shaped center piece flanked by two wings, weighs 3¾ pounds and is about 20 in. long. About one-fourth of the top surface is gold plated, with the balance chrome plated. In the process the casting first is given a copper strike, followed by nickel. Masking material, a copper-nickel alloy covered by a plastic coating, is bridged across the area to be gold plated, the masking material removed and this area gold plated. The gold plate is sprayed with a coating of enamel and baked for one hour.

GM Reports Big Quarter Sales

GENERAL MOTORS net sales in the second quarter were better than $1145 million, yielding net income of over $110 million or $2.43 per common share. It appears that GM will wind up this year with net sales of around $4.5 billion, an all-time high. Inventories at the end of June were better than $732 million, up about $40 million over the figure six months preceding.

Packard Income Best Since 1937

BEST six-month earnings by the Packard Motor Car Co. since 1937 were revealed in the company's financial report for the first half of 1948. Consolidated net income after taxes was $6,213,805 and the equivalent of a little better than 41 cents per share of common stock. Bulk of this profit was earned in second quarter. Production for the period was 46,200 units, comparing with 24,472 in the same interval a year ago and with 55,477 in all of 1947.

Purchasing Division Expanded

EXPANSION of the purchasing activities of the Lincoln-Mercury Division of Ford which will triple its present volume and bring total purchases to $250 million annually is announced. Herbert H. Foster, recently appointed general purchasing agent of Lincoln-Mercury operations to succeed the late George W. Walker, is working out details of the program which completes the autonomy of the L-M purchasing department. Thirty key purchasing people from the Ford organization are being transferred to the division, since buying responsibility for all Mercury parts has been assigned to Lincoln-Mercury.

Assisting Mr. Foster in the expanded L-M purchasing department is Charles S. Brown, who will supervise purchases of all machine parts, machine assemblies and nonproductive materials. J. H. Barnes, formerly assistant purchasing agent in charge of the body and stampings department at Ford, is the second Lincoln-Mercury purchasing agent. He will supervise the buying of bodies, stampings and allied parts.

Powdered Metal Bushings Used

OIL-IMPREGNATED powdered metal bushings are used in shock absorbers, steering assembly, generators, starters, distributors, windshield wipers, clutch cross shaft, pilot shaft, oil and water pumps and electric blower motors in current Ford-Lincoln-Mercury models. The parts are formed of chemically pure powdered metals under 10 to 60 tons pressure, sintered at around 2100 degrees F., and soaked with oil under pressure.

Develops Lubricating Greases

SIX new automotive lubricating greases developed by the Army's Ordnance Department and the petroleum industry will be tested by a convoy of twelve 2½-ton Army trucks under all conditions. Identified as "Operation Greaseball," the convoy left Aberdeen Proving Ground on Aug. 2 and will undergo such extremes as traveling through the blistering heat of the California deserts and the bitter cold of an Alaskan winter.

A TAP
SHOULD BE JUDGED ON PERFORMANCE

The value of a tap can be most accurately measured by the number of acceptable holes threaded before it has to be discarded. When Sheffield high speed taps are measured in this way, they win preference.

Reports from the field consistently indicate the extra performance of these tools. Here are some typical quotations taken from these reports:

"They run longer than any taps we've ever used."

"Has produced 1800 pieces and is still going."

"These taps run from 8 to 16 hours between grinds. The best we've had before ran only 2 to 4 hours."

"Sheffield taps have solved one of our difficult problems."

You, too, may find that Sheffield taps will increase your production and reduce your tapping costs. There is a Sheffield tap engineer ready to work with you to assure that type of result.

MASTER CRAFTSMEN SHEFFIELD HEADQUARTERS

2927

the Sheffield Corporation

..., Ohio U. S. A.

Sheffield's Principal Products Include Gages, Measuring Instruments, Machine Tools, Threading Tools and Contract Services. Standard Gages shipped within 24 hours.

New Scovill Rolling Mill

Brass manufacturer plans to begin output of cold-rolled sheet and strip by yearend

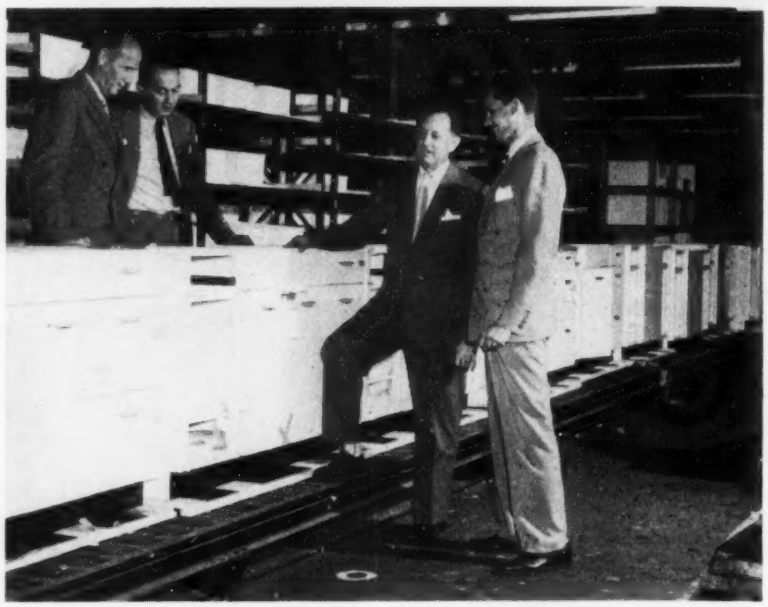
SCOVILL Mfg. Co., Waterbury, Conn., plans to begin production at its new nonferrous rolling mill before the end of the year.

The brass manufacturer will cold roll copper base alloys in sheet and strip form on equipment which will be housed in an addition, now under construction, to an existing structure completed in 1916 at Waterbury.

Work began 14 months ago, and the first section, the machine shop, is finished and in use. The project represents a major portion of the company's general modernization program.

Mill production will be accomplished by rolling ¾-ton and 1-ton brass cakes from a 2½-in. thickness to finished gage thicknesses ranging from .375 to about 0.010 in. Three individual mills, to be housed in the addition situated on four acres of land, comprise the chief items of new equipment for the facility.

Scovill engineers and Stone & Webster Engineering Corp., Boston, designed and engineered the project. Turner Construction Co., New York, is the general contractor for the building and foundation work.



NEW PRODUCT: First under-sink all-steel kitchen cabinet built by Goodyear Aircraft Corp., Akron, for Montgomery Ward & Co. Inc., Chicago, is examined by executives of both companies. Left to right are: W. V. Hill, Montgomery Ward; T. A. Knowles, vice president and general manager of Goodyear Aircraft; H. W. Crum, Aircraft sales manager; and P. C. Good, Montgomery Ward

Westinghouse Sales at New High

PRODUCTION of Westinghouse Electric Corp., as represented by net sales billed, hit a new record high of $424,456,102 during the first six months of 1948, Gwilym A. Price, president, has reported. This was a 7 per cent increase over the previous high of $395,564,740 set in the same period of 1944. Output during the first six months of last year totaled $312,338,636.

Net profit for the first six months of this year amounted to $24,941,100, compared with $21,735,442 in the same period of 1947. Unfilled orders on hand at the end of June totaled $686,615,274, compared with $673,496,915 on June 30, 1947.

Farrel Marks Century's Growth

PARALLELING American industrial growth over the past century is the development of Farrel-Birmingham Co. Inc., Ansonia, Conn., which this year marks the 100th anniversary of one of its predecessor companies, Farrel Foundry & Machine Co.

The Farrel company had its beginning in 1848 when Almon Farrel and his son Franklin established a shop in Ansonia to make brass and iron castings, wooden mortise gears and parts for water-power plants. The firm later specialized in rolling mill equipment for the copper and brass industries, and was also a pioneer in the development of processing machinery for the rubber industry.

In 1927 Farrel merged with Birmingham Foundry in nearby Derby, Conn., to form the present company. Today the firm produces processing machinery, gears, presses, foundry items and weldments for a wide variety of domestic and foreign industries. Company has plants in Ansonia, Derby and Buffalo.

Giddings & Lewis Buys Firm

GIDDINGS & Lewis Machine Tool Co., Fond du Lac, Wis., manufacturer of milling, drilling and boring machines, has purchased Cincinnati Planer Co., producer of many types of planers.

There will be no change in operation of the Cincinnati firm, which becomes a wholly owned subsidiary of Giddings & Lewis. John H. Daum will continue as executive vice president and general manager. Giddings & Lewis executives now hold the following offices at Cincinnati: Robert G. Kraut, president; William E. Rutz, vice president; and Russel E. Hanson, treasurer. Purchase price was in the neighborhood of $3 million.

The Ohio company was formed in 1898. From 1908 to 1925 it supplemented its planer line with boring mills and milling machines. Its present plant and office building was built in 1906, expanded in 1910, 1917 and 1942. Floor space totals 105,000 sq ft.

Former owners of Cincinnati, Sidney G. Rose and Philip Moskowitz, have purchased Rice & Adams Corp., Buffalo, manufacturer of dairy products machinery. The Rose-Moskowitz group also owns and operates Empire Case Goods Co., Jamestown, N. Y., manufacturer of bedroom furniture, and Frederick Iron & Steel Inc., Frederick, Md., producer of pumps, shears and presses.

Four Aircraft Plants Activated

MUNITIONS Board has approved an agreement between the Navy and the Air Force on the activation of several plants in connection with the joint aircraft program.

The facilities are: Naval Industrial Reserve plant, Kansas City, to be operated by Westinghouse Electric Corp.; North shop of the former Wright Aeronautical plant at Lockland, O., now owned by Electric Auto Lite Co., to be operated by General Electric Co.; Walworth Co. plant, Washington Park, Ill., to be operated by Emerson Electric Co., and Boeing Aircraft assembly plant, Wichita, Kans., to be operated by Boeing Aircraft Co.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Landis Tool Co., Waynesboro, Pa., manufacturer of precision grinding machines, recently presented service award pins to 201 employees with 20 or more continuous years of service.

—o—

Rheem Mfg. Co., San Francisco, manufacturer of steel shipping containers and water heaters, has formed an association with Evenblij Vaten N. V., of Koog Aan De Zaan, near Amsterdam, Holland, to build a steel shipping container factory. New company is called Rheem Evenblij N. V. Rheem has four other affiliate companies with plants in Australia, Malaya, Canada and Brazil.

—o—

United States Atomic Energy Commission has awarded a grant to Massachusetts Institute of Technology for research on application of radioactive tracer techniques to mineral engineering problems.

—o—

Illinois Zinc Co., Chicago, has completed its expansion and modernization program and is offering delivery in three to five weeks of Eraydo Alloy, a combination of zinc, copper and other materials, used by the construction industry for gutters, downspouts and other applications.

—o—

Lone Star Steel Co., Lone Star, Tex., is installing facilities for expanded slag production. Firm's blast furnace will be shut down for about 30 days during installation of the slag facilities and also during construction of a new carbon block bottom.

—o—

Metalite Mfg. Co., producer of drawn and stamped metal products, has moved to a new plant and office at 924 Thompson Ave., Glendale, Calif.

—o—

ATF Inc., Elizabeth, N. J., reports its subsidiary, American Type Founders Sales Corp., has expanded arrangements with Vickers-Armstrong Ltd. to include manufacture in England of ATF's Little Giant automatic cylinder printing presses.

—o—

Westinghouse Electric Corp., Pittsburgh, and **Baldwin Locomotive Works,** Eddystone, Pa., announce a plan whereby Westinghouse will purchase 500,000 shares of authorized, but unissued, Baldwin common stock. This purchase, added to shares previously acquired, will increase Westinghouse interest in the other firm to 21.68 per cent. The two firms have for many years collaborated on development and design of various types of railroad locomotives.

—o—

Kropp Forge Co. has offered War Assets Administration $755,000 for a Cicero, Ill., forge plant, it is operating under lease. The offer was the only one received.

—o—

Condenser Service & Engineering Co. Inc., Hoboken, N. J., producer of condensers, boilers and allied products, has named Acme Engineering & Sales Inc., New Orleans, as its marine sales representative for Texas, Louisiana, Mississippi and Alabama.

—o—

Clipper Mfg. Co., Kansas City, Mo., manufacturer of masonry saws, blades and portable hoists, has opened a branch office at 422 Market St., San Francisco.

—o—

Martin-Quaid Co., Philadelphia, fabricator of alloy metals, has acquired the United States business of Hynes Electric Heating Co., Camden, N. J., which will be transferred to Philadelphia to become Hynes Electric Heating & Process Division. Unit will specialize in the design and production of specialized industrial heating applications.

—o—

Jeffrey Mfg. Co., Columbus, O., has acquired Case Crane & Kilbourne Jacobs Co., also of Columbus, for increased production of mining, material handling and processing equipment. The latter firm, structural steel fabricator, will become a subsidiary.

—o—

Wysong & Miles Co., Greensboro, N. C., plans to build a $100,000 foundry at Greensboro to supply semi-steel, brass and aluminum castings used in the manufacture of its sheet metal machinery.

—o—

Wolverine Tube Division, Detroit, Calumet & Hecla Consolidated Copper Co., has granted a 12½-cent wage increase to its hourly-rated workers and an 8.8 per cent increase to salaried employees.

—o—

Howard Foundry Co., Chicago, has purchased a magnesium foundry at Belmont, Calif., from Dalmo-Victor Inc., San Francisco, manufacturer of hardware.

—o—

E. W. Bliss Co., Detroit, reports a 50 per cent increase in the capacity of its Hastings, Mich., plant for the production of power press service parts has resulted in record shipments during the past few months.

—o—

Federated Metals, division of American Smelting & Refining Co., New York, will begin production this month at its expanded Houston, Tex., plant. Facility will manufacture solders, bearing metals, battery metals, lead ingot, type metals and special white metal alloys. J. J. Harutun is manager of the unit.

—o—

Marquette Machinery Co., dealer in late-type used production machine tools, has moved from the Guardian Bldg. to 3800 Maple Ave., Dearborn, Mich.

—o—

Department of Commerce reports that fuel consumption, expressed on a per capita basis, was more than 40 per cent above the 1935-39 average during 1947 and only slightly lower than the consumption during the peak war year of 1944. Fuels are considered mineral fuels and the fuel equivalent of water power.

—o—

Dravo Corp., Pittsburgh, reports that three more steamship lines are using its steel shipping containers designed to solve problems of pilferage and damage. They are Alcoa Steamship Co., United Fruit Co. and Royal Netherlands Steamship Co.

—o—

General Electric Co., Schenectady, N. Y., has granted 46 scholarships and loans totaling $13,150 to employees and children of employees for undergraduate study in the 1948-1949 school year.

—o—

Economic Cooperation Administration reports that a booklet, "American Business and European Recovery," which outlines the operations of the ECA and the purchasing procedures of participating countries, is available to those interested.

—o—

Bureau of Mines in a recently released report describes three new ore separating devices it has developed. The equipment can be used for separating ore not amenable to ordinary ore-dressing treatments.

—o—

Gray Iron Founders' Society, Cleveland, announces that gray iron foundry executives in Georgia and Florida have established a Southeastern Group. James W. Simmons Jr., secretary-treasurer, Cox Foundry & Machine Co., Atlanta, was elected permanent chairman.

The Business Trend

SUPPLY DIFFICULTIES experienced by the nation's automobile builders resulting in lessened output caused STEEL's industrial production index for the week ended July 31 to drop slightly below the preceding week's postwar high. Latest figure of 170 per cent (preliminary) is still well above the 1936-1939 weekly average, however. Steel ingot output continued high and steady at 93 per cent of capacity with demand showing no sign of slackening in spite of price increases and confusion resulting from the change to f.o.b. mill pricing.

AUTOMOBILES — Not only are supply difficulties hampering current production of cars and trucks but August production appears to be doomed to a volume well below that of July as several plants have found it necessary to close while others have had to curtail output. Some auto builders have managed to keep going but the pinch in components is being felt throughout the entire industry.

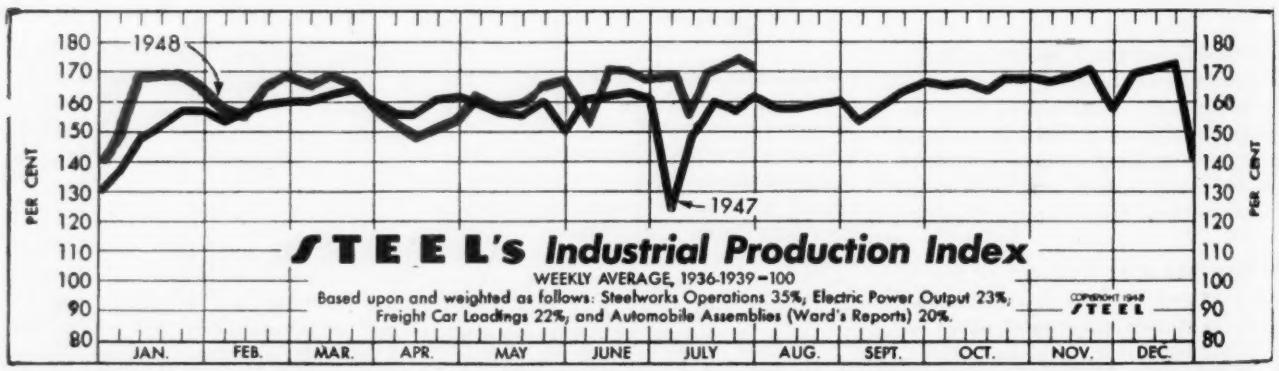
COAL—Bituminous coal production in the U.S. for the week ended July 24 was at a high level of an estimated 12.1 million net tons although it dropped slightly from the previous week's output of 12.2 million net tons. The latest figure is an increase of some 300,000 net tons over the corresponding week last year, but aggregate production from Jan. 1 to July 24, 1948, is down to 319 million net tons as compared to 342.6 million net tons produced from Jan. 1 to July 26, 1947.

CONSTRUCTION—Investment commitments for construction in the 37 states east of the Rocky Mountains soared to $4.8 billion in the first half of 1948 to set an all time dollar record for the period. Contract volume for the first six months of this year was 36 per cent higher than that reported for the corresponding period of 1947.

MANUFACTURERS' SALES—Estimated at $103 billion, manufacturers' dollar sales in the first six months of 1948 were 15 per cent above the 1947 period. According to Department of Commerce officials, the rise was due mostly to higher prices. Manufacturers' inventories stood at $29.8 billion compared with $26.5 billion in 1947. Here again the increase was due largely to higher costs of goods held.

EMPLOYMENT — Demand for labor continues unabated at record levels in keeping with the high rate of industrial activity. Continuation of the long term growth of the working population is indicated by the fact that the total labor force, at 64.7 million this June, was about three-quarters of a million higher than a year ago at the same time. Nonagricultural employment reached a 1948 peak of 44.9 million in June.

BUSINESS — Trend in new business incorporations turned slightly upward in June, following a rather sharp dip in May. According to the latest tabulation by Dun & Bradstreet Inc., the June count was 8550 compared with 8246 in the preceding month. It was, however, 4.2 per cent below the 8922 charterings in June of last year.



Index (chart above): Week ended July 31 (preliminary) 170 Previous Week 171 Month Ago 165 Year Ago 162

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	93.0	93.0	95.0	95.0
Electric Power Distributed (million kilowatt hours)	5,352	5,342	5,166	4,806
Bituminous Coal Production (daily av.—1000 tons)	2,020	2,036	2,128	1,966
Petroleum Production (daily av.—1000 bbl.)	5,455	5,448	5,484	5,088
Construction Volume (ENR—Unit $1,000,000)	$114.3	$143.2	$160.9	$100.8
Automobile and truck output (Ward's—number units)	113,706	118,797	112,349	97,712

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons.

TRADE				
Freight Carloadings (unit—1000 cars)	884†	883	757	922
Business Failures (Dun & Bradstreet, number)	98	91	103	69
Money in Circulation (in millions of dollars)‡	$27,821	$27,864	$27,900	$28,129
Department Store Sales (changes from like wk. a yr. ago)‡	+9%	+9%	+7%	+5%

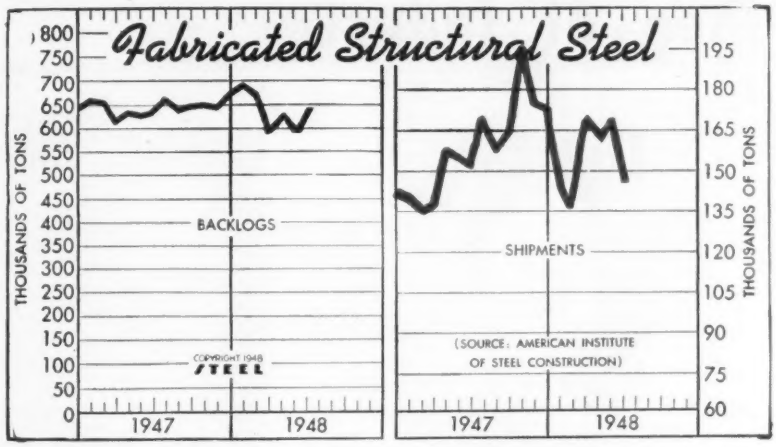
† Preliminary. ‡Federal Reserve Board.

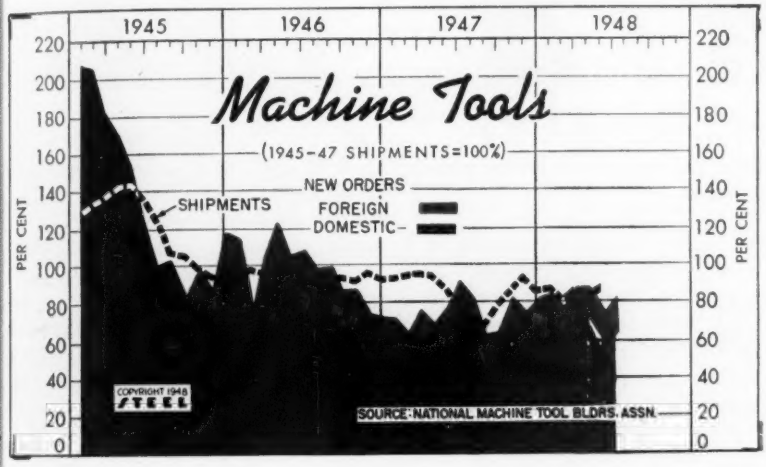
Fabricated Structural Steel

(000 Tons)

	Shipments			Backlogs		
	1948	1947	1946	1948	1947	1946
Jan.	146.4	140.6	107.5	692	661	552
Feb.	141.6	136.1	63.8	673	656	551
Mar.	167.0	137.8	102.8	597	614	605
Apr.	165.7*	157.4	122.5	630	632	674
May	179.7*	155.0	124.4	593	628	615
June	147.7	151.9	126.8	647	634	642
July	....	169.9	140.2	...	661	674
Aug.	....	158.0	157.5	...	639	651
Sept.	....	164.3	141.9	...	648	682
Oct.	....	196.1	164.7	...	649	660
Nov.	....	175.0	157.3	...	645	665
Dec.	....	173.0	142.1	...	671	646
Total	....	1,915.1	1,551.6			

* Revised.





Machine Tools

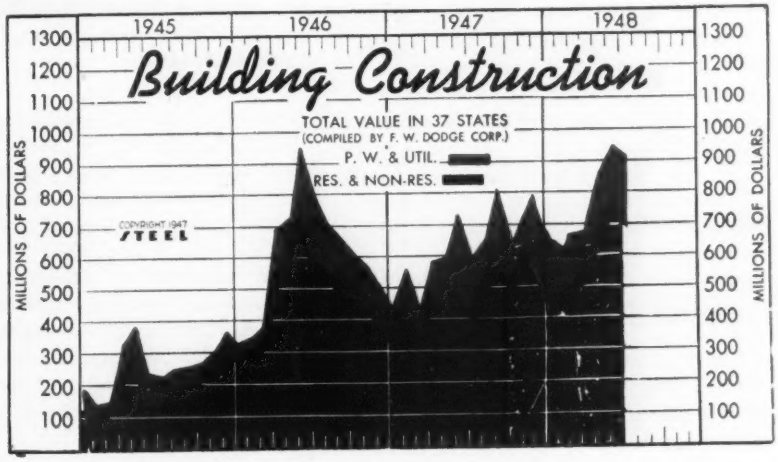
(1945-47 Shipments=100)

	Orders				Shipments (3 Mos. Ave. Centered)	
	Total		Domestic			
	1948	1947	1948	1947	1948	1947
Jan.	83.1	71.7	69.1	50.7	86.9	93.1
Feb.	77.3	63.8	64.6	48.0	81.9	94.8
Mar.	86.3	74.3	70.2	54.2	84.2	95.4
Apr.	86.3	69.8	72.2	51.0	82.7	94.3
May	73.5	76.9	62.1	60.6	86.6	88.9
June	81.8	90.9	69.9	73.7	...	79.5
July	...	81.1	...	64.4	...	71.0
Aug.	...	62.1	...	47.5	...	68.6
Sept.	...	63.7	...	49.0	...	78.5
Oct.	...	81.0	...	65.0	...	85.5
Nov.	...	75.6	...	64.1	...	92.6
Dec.	...	81.1	...	66.3	...	86.1

Construction Valuation in 37 States

(Unit—$1,000,000)

	Total	Public Works Utilities		Residential and Non-residential	
	1948	1948	1947	1948	1947
Jan.	615.2	136.6	113.9	478.6	457.7
Feb.	682.0	177.3	90.5	504.6	351.6
Mar.	689.8	164.3	122.0	525.5	474.8
Apr.	873.9	184.7	161.4	689.2	441.0
May	970.8	205.0	252.9	765.8	490.0
June	935.2	215.7	185.7	719.5	419.4
July	....	....	165.9	....	494.4
Aug.	....	....	223.5	....	599.7
Sept.	....	....	141.5	....	508.4
Oct.	....	....	165.9	....	627.4
Nov.	....	....	181.5	....	533.6
Dec.	....	....	154.1	....	471.3
Totals	....	....	1,958.8	....	5,869.3



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$13,016	$14,257	$14,056	$11,941
Federal Gross Debt (billions)	$253.4	$253.4	$252.4	$259.3
Bond Volume, NYSE (millions)	$14.5	$20.0	$18.8	$18.5
Stocks Sales, NYSE (thousands)	4,490	6,906	4,764	5,256
Loans and Investments (billions)†	$63.2	$62.9	$62.9	$63.5
United States Gov't. Obligations Held (millions)†	$34,879	$34,656	$34,869	$39,154

† Member banks, Federal Reserve System.

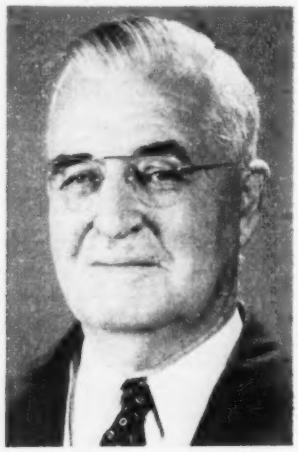
PRICES

STEEL's composite finished steel price average	$89.09	$89.09	$80.27	$75.41
All Commodities†	168.2	168.9	166.7	150.6
Industrial Raw Materials†	184.6	186.4	185.2	166.0
Manufactured Products†	163.1	163.4	160.5	145.0

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

HENRY B. SHEPHERD



MYRON S. CURTIS

J. E. CROTTY

Betz-Pierce Co., Cleveland, steel distributor serving northern Ohio since 1911, has announced election of **Henry B. Shepherd** as vice president and a member of its board of directors. Mr. Shepherd entered the steel industry after his graduation from Yale University in 1928, and joined Jones & Laughlin Steel Corp. in its Cleveland district sales office in 1929. He served with that company in various capacities, from the order department to assistant district sales manager. In 1943 he was transferred to Washington as district sales manager, and served in that capacity until his return to the Cleveland office in 1945.

—o—

Francis S. White, director of purchases, Budd Co., Philadelphia, has been placed in charge of all purchases within the company, including the Hunting Park and Red Lion plants in Philadelphia, and the Charlevoix and Atwater plants in Detroit. **Carl Koelsch,** who has been in charge of steel purchases for the Detroit plants since September, has been transferred to Philadelphia, and will be second in authority to Mr. White in steel procurement. **Henry K. Arnold** is now central material manager for Budd Co., with the primary responsibility of governing the allocation of iron and steel products procured by the purchasing department.

—o—

Norton Co., Worcester, Mass., recently announced appointment of **George C. Gibbons** as resident manager of the company's bauxite plant in Bauxite, Ark. He succeeds **C. Lawton Rucker,** who has retired after 32 years' service with the company. Mr. Rucker was formerly superintendent of the Bauxite plant and lately resident manager.

—o—

Myron S. Curtis has been appointed director of engineering, Warner & Swasey Co., Cleveland. He succeeds **William J. Burger,** who retired in June as a director of the company and director of engineering. Mr. Curtis and **Frank E. Joseph** have been elected directors of Warner & Swasey Co. Mr. Joseph is a member of the law firm of Jones, Day, Cockley & Reavis, and succeeds his late partner, **Thomas H. Jones.**

—o—

Henry B. Clark has been appointed to the managership of the New York sales office of Diamond Alkali Co., Cleveland. Mr. Clark, who has been branch manager of the company's Boston sales office since 1946, succeeds **Charles V. Douglas,** whose resignation becomes effective Aug. 15. At the same time, **Charles L. Flaccus Jr.** has been named assistant branch manager at New York. He has been a salesman for the company, working out of the New York office for the past nine years.

—o—

Ralph J. Kraut has been elected president, Cincinnati Planer Co., Cincinnati, recently purchased by Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., of which Mr. Kraut is president and general manager. Other officers are: **J. H. Daum,** executive vice president and general manager; **Jesse Daugherty,** vice president and works manager; **W. E. Rutz,** vice president; **R. J. Steiner,** secretary and comptroller; **R. E. Hanson,** treasurer and counsel; **R. D. Allison,** assistant treasurer and assistant secretary; **E. W. Kroeger,** assistant sales manager; **C. J. McMoth,** executive assistant; **W. B. Wigton,** chief electrical engineer; **J. W. Knippling,** purchasing agent; and **J. G. Daum,** production manager. The board of directors of the Cincinnati company consists of **Mr. Kraut, Mr. Rutz, K. F. Gallimore, J. Roy Porter, J. M. Conway, W. E. Buchanan, J. H. Daum,** and **Mr. Hanson.**

—o—

Aetna-Standard Engineering Co., Youngstown, announces appointment of **J. E. Crotty** as sales engineer for its wire drawing equipment. He had been employed by the W. S. Tyler Co., Cleveland, for three years in the screening machine engineering department. He was with Trauwood Engineering Co. from 1939 to 1946, designing and engineering wire heat treating and processing equipment. Between 1946 and 1948 he was manager of the wire department for Manganese Steel Forge Co., Philadelphia.

—o—

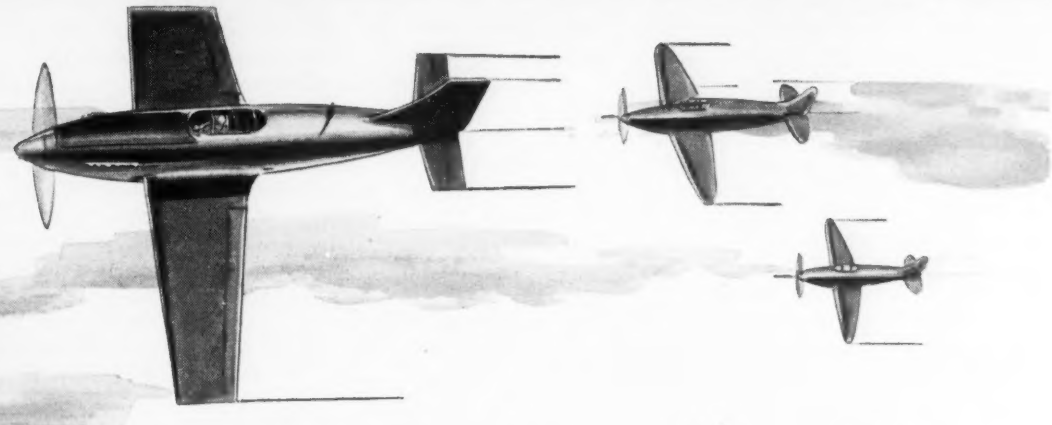
Robert W. Eiler, secretary and general attorney, National Supply Co., Pittsburgh, has been elected a director of the company, succeeding **Charles R. Barton,** retired. Mr. Eiler is also secretary and director, National Supply Export Corp., National Supply Co. Ltd., and National Supply Construction Corp., and is a director of Fretz-Moon Tube Co., Butler, Pa.

—o—

Barber-Colman Co., Rockford, Ill., announces appointment of **John C. Preston,** Preston Machine Tool Sales Co., as exclusive distributor in Texas for Barber-Colman hobbing machines, hob sharpening machines, hobs, cutters and reamers.

—o—

Roger M. Kyes, formerly president and general manager, Harry Fer-



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The National Air Races go *International!* In keeping with the world-wide spirit of these times, a new feature event of this year's air race program will be the Tinnerman International Trophy Race.

Pilots and planes of all nations will answer the starter's flag on Saturday, September 4. As they roar around 7 laps of the 15-mile course, every part on every plane will be undergoing the severe test of all-out performance. From tests like this, aircraft manufacturers have developed modern miracles of air transportation.

The Tinnerman Trophy Race is a tribute to these manufacturers . . . a tribute paid by the producer of SPEED NUTS*, SPEED CLIPS* and SPEED CLAMPS*. These Tinnerman Fasteners, on military and commercial planes, are playing a major role in aviation's great advancement. TINNERMAN PRODUCTS, INC., 2038 Fulton Road, Cleveland 13, Ohio.

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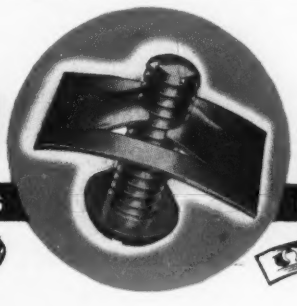
TINNERMAN  *Speed Nuts*

*Trade Mark Reg. U. S. Pat. Off.

FASTEST THING IN FASTENINGS — MORE THAN 4000 SHAPES AND SIZES

guson Inc., tractor manufacturer, has joined the staff of General Motors Corp., Detroit, on special assignments, reporting directly to **C. E. Wilson,** president. Assistant to the president, Glenn L. Martin Co., Baltimore, in 1928, Mr. Kyes later became assistant to the vice president of Black & Decker Mfg. Co., then was president of Empire Plow Co. and in 1941 joined Ferguson-Sherman Mfg. Corp., later Harry Ferguson Inc., becoming president and general manager in 1943, and retiring from the company last fall.

—o—

L. M. Hackenberg has been named to supervise activities of the new sales office recently opened at 150 Broadway, New York, by C. J. Tagliabue Corp., subsidiary, Weston Electrical Instrument Corp., Newark, N. J. Mr. Hackenberg is New York district sales manager for Tagliabue.

—o—

James E. Coleman has been named assistant purchasing agent for the Pittsburgh Group of associated natural gas companies in the Columbia Gas System Inc. He joined the public utility organization in 1937 as an industrial engineer. Since 1945 he has been assistant sales manager.

—o—

Howard B. Steggall, vice president in charge of the Pacific Steel Boiler Division, United States Radiator Corp., Detroit, has been elected a director of the corporation, succeeding **Carroll M. Baumgardner,** who has resigned as director and executive vice president. Mr. Steggall started with the corporation in 1922 in the test laboratory in Detroit, served five years in the New York sales office, and was branch manager in Pittsburgh for 14 years. He was elected vice president in 1945.

—o—

Henry J. Kaiser announces that, owing to the increased activities of the several Kaiser managed companies, he has appointed **A. B. Ordway** to the executive staff handling the overall policies of the Kaiser industries, and **Jack L. Ashby** to the position of vice president and general manager of the Iron & Steel Division, Kaiser Co. Inc. Mr. Ashby has been associated with Kaiser Co. Inc. for several years, serving in the capacity of general sales manager, and more recently vice president and assistant general manager. This division operates the Kaiser Co.'s Fontana steel plant. For the past four years, Mr. Ordway has been vice president and general manager of the Iron & Steel Division, and prior to that time and including some 36 years of service with Kaiser interests, Mr. Ordway has been an executive officer in many of the Kaiser affiliated companies, having been president of one for 14 years. **C. Bruce Wood,** controller, Kaiser Steel, for four years, has been promoted to assist Mr. Ordway on the Kaiser executive staff. **Robert Walker**, assistant controller of Kaiser Steel, has been promoted to controller, with headquarters in the main office in Oakland, Calif.

—o—

G. Joseph Keady has been promoted to the post of president, Sharples Corp., centrifugal and process engineer, Philadelphia. Formerly executive vice president, he succeeds **Philip T. Sharples,** who has been named chairman of the board.

—o—

Election of **William P. Marsh Jr.** as president of U. S. Industrial Chemicals Inc., New York, and the retirement of **Glenn L. Haskell** from that post, has been announced by the company. Mr. Haskell, a director since 1934 and president since 1943, becomes vice chairman of the board. Mr. Marsh joined the company in 1937, was elected vice president in 1943, a director in 1947, and has been executive vice president since the first of this year.

—o—

Thor M. Olson has resigned as vice president in charge of sales, Ex-Cell-O Corp., Detroit. He had been with the firm since his company, the Continental Tool Works, merged in 1930 with the larger corporation. He was the principal organizer of two cutting tool companies, one of them, in 1919, the Continental Tool Works. In addition to his position as vice president in charge of sales for Ex-Cell-O, he was also a member of the board of directors.

—o—

Leland W. Mosher has been elected an assistant secretary of the General Electric Co., Schenectady, N. Y., and will also retain his present position as manager of the Insurance Division.

—o—

Willys-Overland Motors Corp., Toledo, O., announces reorganization of its Procurement Division into two major groups, one for purchases of productive material and the second for materials classified as "non-productive." In the productive materials group, **M. P. Williams** is purchasing agent for stampings and their dies, frames, body assemblies, parts, body hardware, trim, paint and glass. **G. R. Cheetham** is purchasing agent for mechanical and electrical units and assemblies, covering such items as complete chassis units, machined parts, electrical equipment, screws, bolts, standard parts, tires and tubes. **J. S. Conant,** recently appointed general purchasing agent, will also act as purchasing agent for raw materials, including iron, steel castings, forgings, patterns and dies, lumber and nonferrous materials. In the non-productive materials group, **H. W. Fels** is purchasing agent for office and plant supplies. **I. A. Degner** is purchasing agent for capital goods and is also charged with the disposal of obsolete or surplus materials and by-products of manufacture.

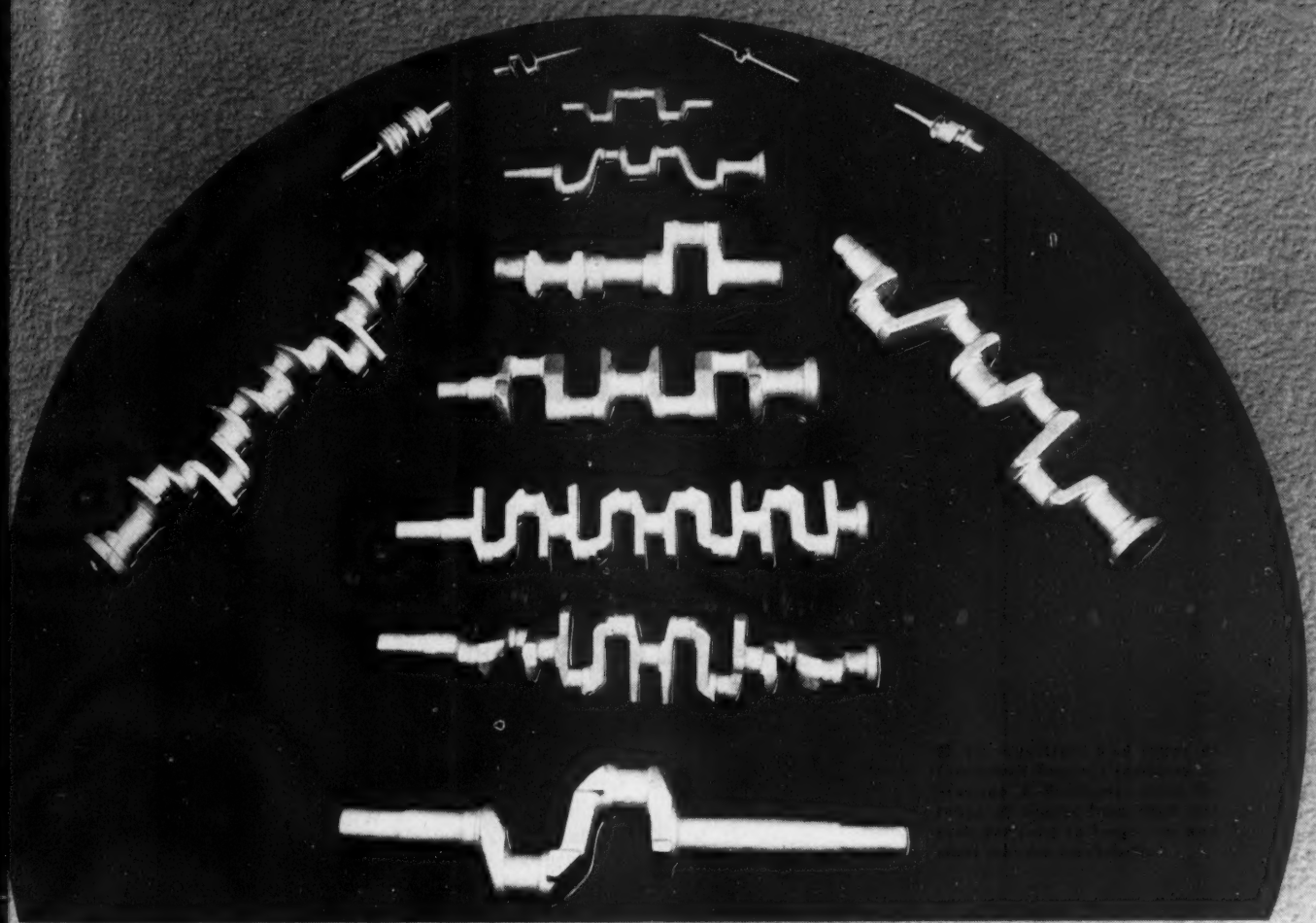
—o—

Orville C. Hoover will be superintendent of the new foundry being constructed by Wysong & Miles Co., Greensboro, N. C., which will supply semi-steel, brass and aluminum castings used in the manufacture of the company's line of sheet metal machinery. Mr. Hoover has had association with Perfect Circle Piston Ring Co., Newcastle, Ind; Sheppard Elevator Co., Cincinnati; Acme Furnace Co., Detroit; Thomas Mfg. Co., Birmingham. Officers of the Greensboro firm are **Russell F. Hall,** president;

THOR M. OLSON

ORVILLE C. HOOVER

TRANSUE FORGINGS



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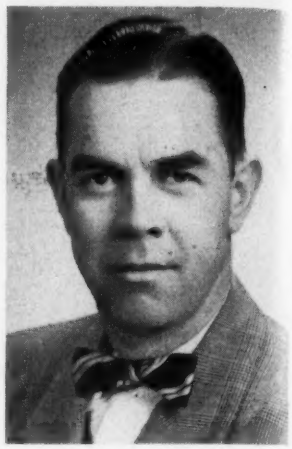


JAMES W. MAY

W. R. Kime, vice president and general manager; **W. A. Balsley,** vice president; **Russell F. Hall Jr.,** secretary; **E. K. Patterson,** treasurer; **J. O. Weisner,** plant superintendent; and **Ralph Weisner,** chief engineer.

—o—

Frank B. Rackley has been appointed general manager of sales for Jessop Steel Co., Washington, Pa. Formerly head of stainless steel sales, western area, for Carnegie-Illinois Steel Corp., he now succeeds **T. W. Pennington,** former vice president of Jessop, who resigned recently.

—o—

Robert C. Singleton has been placed in charge of a new customer engineering service department established by Nelson Stud Welding Division, Morton Gregory Corp., at its Lorain, O., headquarters. Mr. Singleton joined the stud welding organization in 1945 as field engineer, and has served as its chief metallurgist and technical adviser at Lorain. Prior to joining the Nelson organization, he was metallurgical engineer with Joshua Hendy Iron Works at Sunnyvale, Calif.

—o—

William C. Norvell has been appointed manager of aviation sales for the Lighting Division, Westinghouse Electric Corp., Pittsburgh. **M. R. Granger** has been made manager of the Cincinnati branch office of the company.

—o—

A. B. Murray Co. Inc., New York, announces appointment of three new sales representatives, **Richard H. Lamont, Charles C. Northrup** and **Collins Boyce,** assigned to the eastern Ohio, Pittsburgh and Buffalo-Erie areas, respectively, with headquarters at the firm's McKeesport, Pa., warehouse office.

—o—

Jones & Laughlin Steel Corp., Pittsburgh, announced appointment of **W. F. Huntley** as assistant to superintendent, blast furnace department, at the Aliquippa works. **R. E. Edwards** has been appointed assistant to superintendent of open hearth and bessemer department, and **A. B. Millman,** assistant to superintendent of maintenance.

—o—

Paul E. Thomas has been promoted to chief engineer, Gary Steel Works, Carnegie-Illinois Steel Corp. He succeeds **J. Donald Rollins,** who has been promoted to become planning engineer of this U. S. Steel Corp. subsidiary, and will have headquarters in Pittsburgh. For the last year Mr. Thomas has been serving as assistant division superintendent of maintenance at the Gary plant. Mr. Rollins has been with U. S. Steel subsidiaries since 1934. He became associated with Carnegie-Illinois in 1936.

—o—

E. G. Knox has been appointed one of two assistant sales managers under **William H. Hogben,** industrial sales manager, Ditzler Color Division, Pittsburgh Plate Glass Co., Pittsburgh.

—o—

John H. Bartol, formerly passenger sales supervisor, American Air Lines, has joined W. B. Connor Engineering Corp., New York, manufacturer of Dorex Air Purification equipment, and Kno-Draft Adjustable Air Diffusers, as director of the Air Recovery Division.

—o—

Ralph R. Brady has been appointed manager, engineering department, Lamp Division, Bloomfield, N. J., for Westinghouse Electric Corp. He succeeds the late **D. W. Atwater.**

—o—

Dr. Nephi A. Christensen, dean of engineering, Colorado State College, has been appointed director of the School of Civil Engineering at Cornell University. He will succeed **Prof. Carl Crandall,** who has served as acting director since the death of **Director William L. Malcolm** in January.

—o—

American Air Filter Co. Inc., Louisville, announces transfer of **James W. May** from director of research to technical director of its Air Filter Division. Prior to joining American Air Filter in 1943, Mr. May was associate professor of heating, ventilating and air conditioning at the College of Engineering, University of Kentucky.

—o—

William J. Taylor, former chief process metallurgist, Carnegie-Illinois Steel Corp., South Works, Chicago, has resigned his position to join the sales force of Exothermic Alloys Sales & Service Inc., Chicago.

—o—

Walter C. Reed, associated for 20 years as a development engineer in the Pittsfield, Mass., laboratories, General Electric Co., has retired, and announces establishment of a consulting engineering office in Dalton, Mass. Mr. Reed's outstanding achievements were his development of alloys and fluxes and methods of making joints involving metal parts. He was among the first to perfect the use of silver solder for brazing operations.

—o—

Walter R. Turner, since 1945 production manager of Bull Dog Electric Products Co., Detroit, has been appointed vice president in charge of production. Prior to his association with Bull Dog Electric, he was active with Chevrolet Motor Division for over 19 years.

—o—

Adel Precision Products Corp., Burbank, Calif., announces appointment of **Fred T. Miller** to the position of

sales manager of the firm. Mr. Miller has been associated with Adel for seven years, and prior to his present position was the firm's West Coast sales representative. In this capacity he supervised the supplying of the company's products to the aircraft industry, and marine and industrial fields in western United States.

—o—

Cleveland Pneumatic Tool Co. has elected **Lawrence E. Green,** Boston attorney, and trustee of Textron Pension Trust, as president to succeed **Harold C. Schott,** resigned. Mr. Green will continue as board chairman, which position he attained when the Cleveland company was acquired by Textron Pension Trust of Boston. He is a nationally known tax authority and serves as an officer and director of numerous corporations. His work in Boston requires his presence there most of the time, and **Sam S. Mullin,** formerly vice president, who has been elected executive vice president of Cleveland Pneumatic, will devote full time to the Cleveland plant, and will be responsible for managing its affairs. **Vern R. Drum** has been appointed operations manager, reporting to Mr. Mullin on all production matters. **Clarence B. Quinn,** certified public accountant,

JOSEPH CHINI

has been elected treasurer, and **Paul F. Hellmuth** will continue as secretary.

—o—

Joseph Chini has been appointed superintendent of the foundry Division, Sperry Gyroscope Co., division of the Sperry Corp., Great Neck, N. Y. He succeeds **Stanley E. Tims,** who has left the company. After studying metal processes at the Velberter Hochschule in Germany, Mr. Chini came to the United States and has specialized in foundry techniques for 31 years. Prior to joining Sperry as general foreman in 1943, Mr. Chini was superintendent of the Howard Foundry in Chicago.

—o—

Steel Joist Institute, Washington, has elected the following officers: President, **George R. Wernisch,** re-elected to serve a second term. He is manager of the Steel Joist & Deck Division, Ceco Steel Products Corp.; vice president, **James D. Maitland,** re-elected to serve a second term, is president, Colorado Builders Supply Co., Denver; and secretary-manager, **C. H. Luedeman,** appointed to direct the institute's activities. The new address of the Steel Joist Institute is—Dupont Circle Bldg., 1346 Connecticut Ave., N. W., Washington.

—o—

M. B. Garber, assistant sales manager and export manager, Thew Shovel Co., Lorain, O., since 1937, has been appointed general sales manager to succeed the late **Don G. Savage. Q. J. Winsor** and **J. T. Cushing** have been appointed assistant general sales managers. Mr. Winsor previously held the position of assistant to the general sales manager and district sales manager for the East-Central territory, and Mr. Cushing has been district sales manager for the West Coast, located in San Francisco.

OBITUARIES . . .

A. F. Dohn, 72, director and honorary vice president, Allegheny Ludlum Steel Corp., Pittsburgh, died in Albany, N. Y., July 29. He retired as vice president in charge of tool steel sales for the company in 1941, after more than 30 years as a steel salesman. Formerly an executive of Atlas Crucible Steel Co., now the Dunkirk, N. Y., plant of Allegheny Ludlum, Mr. Dohn served as its president until it merged with Ludlum Steel Co. in 1929, when he became a director and vice president of sales for the latter company. He held those positions until 1938, when Ludlum merged with Allegheny Steel Co. to form Allegheny Ludlum Steel Corp. He was named director and vice president in charge of tool steel sales of the new organization.

—o—

Frederick A. Stevenson, 68, former president, American Car & Foundry Co., New York, who retired from active service with the company in 1947, died July 29. He had been associated with ACF for more than 40 years in various capacities.

—o—

French E. Bassett, 50, manager, Danville, Ill., plant of Saginaw Malleable Iron Division, General Motors Corp., died July 23 in an automobile accident.

—o—

Don G. Savage, 50, vice president and general sales manager, Thew Shovel Co., Lorain, O., died July 25 of a heart attack. He had been with the organization for 28 years, serving since 1935 as general sales manager. He died ten days after his elevation to the vice presidency of the power shovel and crane manufacturing firm.

—o—

Albert R. Benson, 49, secretary, Stewart-Warner Corp., Chicago, and several of its affiliates, died of a heart attack July 31. He had been associated with the company 18 years, and secretary since 1943.

—o—

John A. Dow, 46, president, Dow Furnace Co., Detroit, and for a number of years associated with Holcroft & Co., furnace manufacturer, died July 26 as a result of an accident

—o—

Earl W. Knight, 57, director and secretary-treasurer, Hartford Engineering Co., Hartford, Conn., died July 30. Formerly associated with Westinghouse Electric Co., he was sales manager of its Fan Motor Division from 1922 to 1930.

—o—

Philip F. Hourt, 46, assistant production manager of Fedders-Quigan Corp., Buffalo, died Aug. 3.

—o—

Nicholas L. Philips, 42, Buffalo branch manager, Crucible Steel Co. of America, died July 29.

—o—

John C. Gibson, founder and chairman of the board, Pioneer Rubber Co., Willard, O., died recently.

—o—

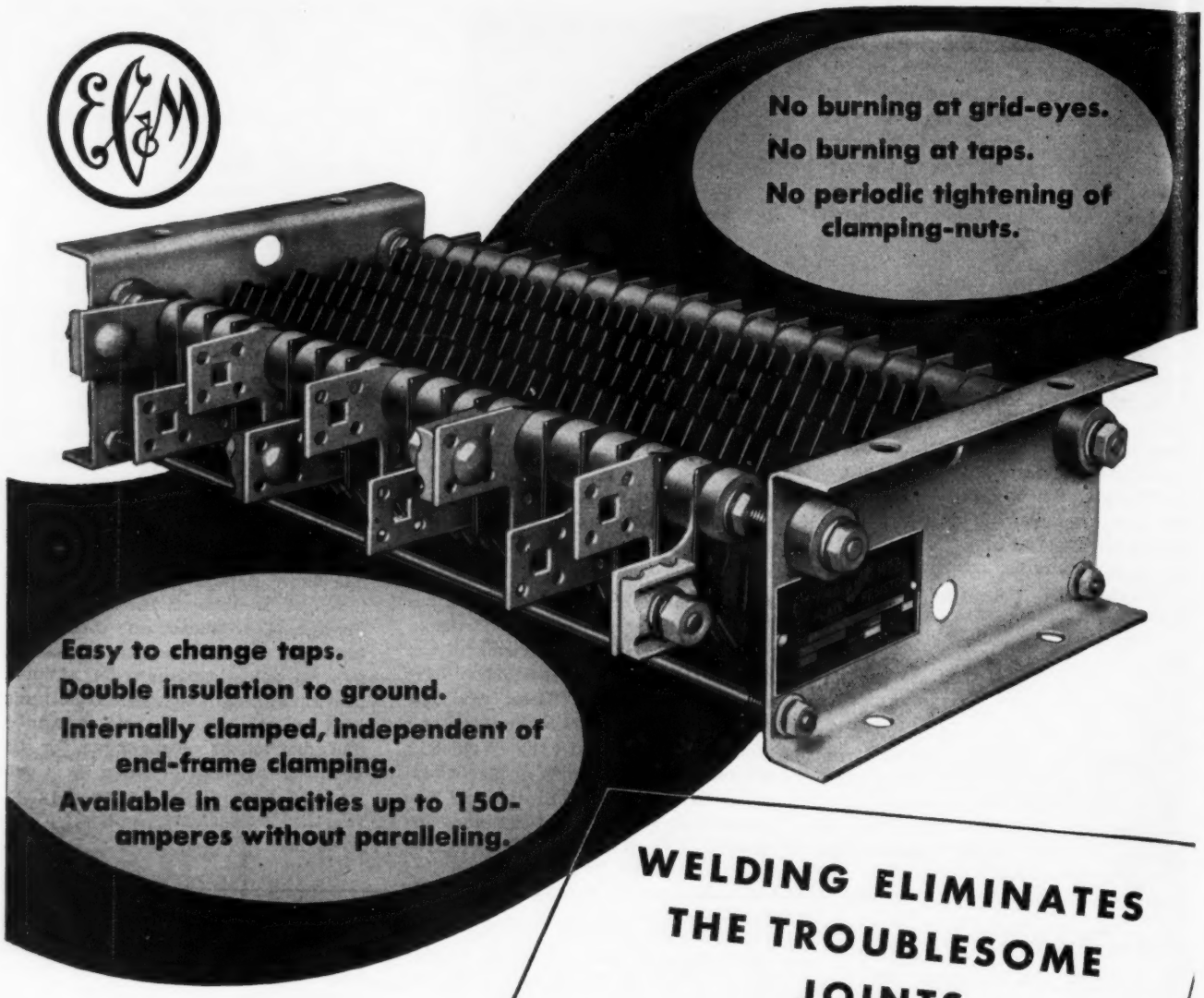
Frederick J. King, 57, head, Production Planning Division, Aluminum Co. of America, Pittsburgh, died of a heart attack July 27.

—o—

Frank J. O'Brien, 70, vice president in charge of sales, Globe Steel Tubes Co., Milwaukee, died July 29.

—o—

Frank F. Marquard, 73, who retired in 1944 as superintendent, Clairton, Pa., plant, Carnegie-Illinois Steel Corp., died July 26. He was known in the steel industry for his discoveries in metallurgical chemistry.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Engineering News . . . AT A GLANCE

TESTS PRECISION CAST CUTTERS— Precision cast milling cutters made from remelted high speed steel scrap not only showed very good performance, but were superior to forged stock cutters, according to preliminary tests in the research and development division of Watervliet Arsenal, the Office of Technical Services, Washington, reports. In a report prepared by John H. Penrose, arsenal metallurgist, it is pointed out that the comparatively few test runs are not yet sufficient to support this contention, and it is planned to use these precision cast cutters in actual production work.

"GROWTH RESISTANT" CAST IRON—Stove tops that won't warp, and furnace bowls that remain true and airtight after years of service are foreseen by metallurgists of Battelle Memorial Institute, Columbus, O., following perfection of an iron that does not "grow" when repeatedly heated to high temperatures. The new material which was developed in research sponsored by Jackson Iron & Steel Co., Jackson, O., is a high-silicon iron—the silicon being the element which provides the "growth resistance." During the casting process, minor amounts of copper and chromium also are added to make the metal resistant to scaling at high temperatures. Battelle reports that the material is excellent for use in applications requiring temperatures up to 1700° F.

NEW PRODUCTION INCREASER— Stove part production in the plant of Harry C. Weiskittel Co., Baltimore, was increased recently some 200 per cent since the development and installation of a device referred to as a "roto-fork." Unit is designed to utilize more efficiently the burning capacity of the furnace used in connection with enameling operations. It consists of four huge rectilinear-shaped forks or arms equally spaced and extending from a fixed central pivot station. It performs simultaneously four operations constantly. Each fork also includes an extension arm that extends and leaves ware to be fired on elevated pigs that support the load inside the furnace.

MASS PRODUCED CASTINGS— A machine which is increasing the yield of high-quality castings at reduced cost, and believed to be the first completely automatic molding unit for mass production of castings by multiple molding methods is now operation at the Cleveland, O., plant of Westinghouse Electric Corp. Developed through joint efforts of International Molding Machine Co., LaGrange Park, Ill., Westinghouse and other co-operating companies, the self-contained molding unit performs all the functions and operations necessary to produce molds—from introduction of the sand ingredients through completion of multiple molds stacked 6-high ready for pouring.

"BOUNCES OFF" HEAT— New process that produces an aluminized steel with heat radiating properties of 85 per cent of the perfect black body, and which reduces gas evolved in vacuum tube production and operation is reported by Sylvania Electric Products Inc., Emporium, Pa. The new material is made in 0.005-inch strips in varying widths, or as anodes and other fabricated parts. In vacuum tube manufacture, the material eliminates need of carbonizing nickel-plated steel parts, provides better welding properties and eliminates possible transfer of carbon to cathode during manufacture. The product was developed in the company's metallurgical research lab in co-operation with Armco's laboratories.

PRESSURE ROTOR CASTING— Casting of motor rotor bars, short circuiting rings and fan blades in one integral section in the Ashtabula, O., plant of Reliance Electric & Engineering Co., is done in a special 60-ton press. Laminations previously pierced on notching presses or with multislot dies are held in alignment on an arbor by an internal keyway, placed in molds and swung into the air-operated press. (p. 74)

SPEEDY BUT EFFECTIVE—Practical and effective method of dissipating high residual welding stresses without distortion or deformation is offered by a fast low-temperature process. It consists of applying heat progressively at 350-400° F from one side for plate thicknesses up to 1⅜-inch.

In several tests, low temperature stress relieving has reduced high longitudinal stresses of 65,000 pounds per square inch in the as-welded state to zero values or to slight residual compression. Transverse stresses were reduced to one-third the as-welded values. (p. 78)

TOOLS FOR MEASURING—Accelerated tests for organic finishes should be made on a comparative basis—using a finish of known field performance as a control to assist in interpreting results of new materials, it is pointed out. After selecting what appears to be a good finish, the material should be field tested on products for positive proof that the finish is fully satisfactory. Inasmuch as a satisfactory finish for a metal product must be "balanced"—one in which an outstanding property is not gained at the sacrifice of other required properties—accelerated tests used for evaluation must be wide enough in scope to cover all important properties. (p. 83)

"BLANKETS OUT" FRICTION— Spun-glass "blankets" are used to overcome friction between sheet and stretch block in stretch-forming magnesium sheets in the plant of Glenn L. Martin Co., Baltimore. Hard smooth surface presented to form block and sheet metal by the glass fibers is reported to promote a sliding action between them. Furthermore, an accompanying passivity of the glass cloth permits it to elongate partially with the sheet metal during the stretching operation. (p. 94)

Tailored-to-

By ED KARPICK
Assistant Editor, STEEL

Fig. 1—Stator boring unit features semiautomatic operation with only loading and unloading of work piece done by machine operator

Fig. 2—Protective screen removed from side of Minster inclined 45-degree press to show slotting dies used in punching rotor and stator laminations. Next locator on die properly positions blank for slot piercing

Fig. 3—Hydraulically-powered, manually-operated manipulators pick up stators from preceding oven conveyor, move them in and out of varnish and place them on following oven conveyor

...the-Job Machines

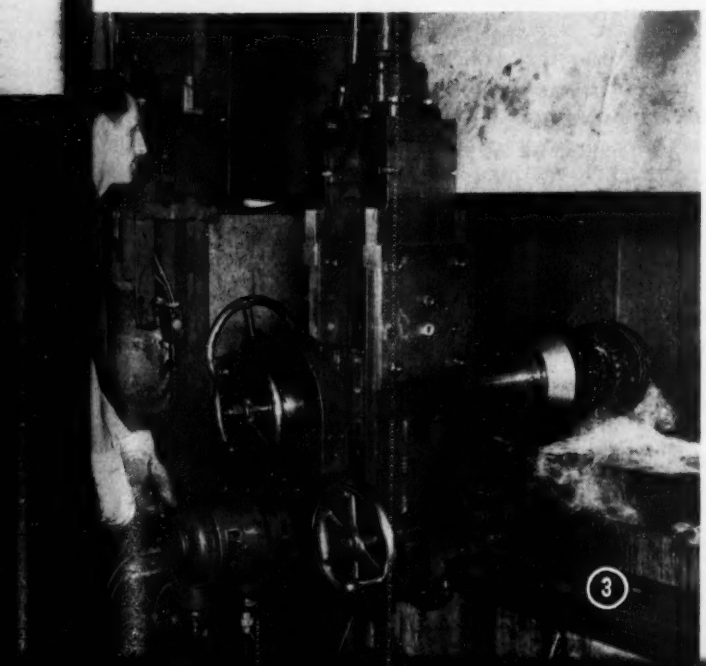
...help new plant reach high output in short order

Modern machines supplied by other manufacturers and special equipment designed and built by company employees enables semiskilled workers to perform a large number of jobs. Conveyors, trucks and hoists used extensively to decrease manual handling and speed production

TAKING advantage of the most modern equipment available on the market for manufacturing operations and the skill and inventiveness of its own designers and engineers, Reliance Electric & Engineering Co., Cleveland, is combining these factors in operations at its new Ashtabula, O., plant. These skills, plus a program of employee selection and training, have enabled the company to attain its expected level of production in less than a year of operation even though there was no trained labor market available when the plant opened its doors.

Manual handling of materials at the new plant is kept to a minimum because Reliance, like other metalworking companies, has found that modern equipment and handling techniques are effective aids for obtaining higher productivity at lower unit cost. Elevating fork trucks, electric powered and hand type pallet trucks perform various handling operations from receiving of raw materials to shipping of motors to consumers. Gravity roller type conveyors are widely used for material movements within each processing department and, where necessary, individual machine tools and work stations are served by jib cranes or motor operated hoists.

Motor, controller and tool design facilities for all company operations are centralized in Cleveland at the engineering building located near the Ivanhoe Division plant. The tool room at the Ashtabula plant confines itself to minor repairs and tool sharpening. Major jig and die repair work, die making and similar functions are performed in the engineering building.



Scope of Operations—Alternating and direct current motors rated from 1 to 20 horsepower are manufactured at the new plant. Subassembly operations are set up on a production line basis and feed into final assembly and testing.

First operation in the manufacture of any alternating current motor at the plant is the formation of the motor shells on a Kane and Roach bending machine out of proper thickness of plate for a prescribed motor size. Subassemblies consisting of feet and motor lead channels are formed in mechanical presses and welded to the motor shells. Laminations for mounting the stator coils are then stacked on an arbor and compressed, the shell placed around the laminations and squeezed shut in a special machine, and this assembly welded shut. This subassembly is then welded on and the outer shell put in place.

Stator and rotor laminations for standard size motors are punched on 100-ton adjustable speed, 45 degree inclined Minster presses, Fig. 2. The multislot dies used are designed and built by employees of the company with a minimum design life of 5 million punchings. In actual operation this life expectancy is often exceeded with the best die to date having already turned out some 11 million punchings and is still going at full blast.

Counting by Weight — Since laminations are punched out of steel strip, it has been found that there is some difference in length of various rotors composed of the same number of laminations depending on whether they have been cut from the center or edges of strip. In order to overcome this differential, stacks of rotors are weighed instead of being counted and results are satisfactory. Stacks are tied together after weighing and are ready for assembly.

After welding, motor frames are taken to a special-purpose Gisholt machine, mounted on a mandrel and both ends are machined at the same time to assure concentricity with inside diameter of laminations. All four motor feet are then ground on a surface grinder which is equipped with a special jig for insuring that feet are parallel to and at the proper

distance from the center line of the motor.

After drilling and tapping bracket mounting holes and drilling the feet holes, frames are transported to coil assembly where preformed coils are inserted into stator slots. Coil connections are made by gas welding. Wire ends are joined by acetylene torch (without solder or flux), assuring strong electrical connections even when motor temperatures are high.

Surge Tester—By gravity roller conveyor the motor frames go to a General Electric surge tester where the stators are checked for shorts between turns in coils, shorts between coils, missed or improper connections and grounds. The tester uses a high voltage (up to 3000 volts) at a high frequency in order to keep the current down. It is in effect a comparator since a trace on the scope indicates condition of windings and an operator with a little experience can readily interpret nature of the difficulty if trace is not normal.

At the end of this conveyor stators come to a conveyorized, semiautomatic varnish dipping and baking process contained in a machine called the Zanderoll. First of its kind, machine was designed and built by Power Piping Division, Blaw-Knox Co., Pittsburgh, under license arrangements with Sterling Varnish Co., Haysville, Pa., which holds patent rights to the process.

With this process automatic timing control of the preheating, dipping and baking sequence is provided within predetermined limits. The 68-foot long machine has three ovens, one for pre-heating and one for each baking operation that follows the two varnish dips given each stator. Heating is by moving air at high velocity over electric heating elements.

Installed between the preheat and first bake oven and between the first and second oven are recirculating type, varnish dip tanks and accompanying hydraulically powered, manually controlled manipulators, Fig. 1. These manipulators pick up stators or armatures from preceding oven conveyor, move them in and out of varnish and place them on following oven conveyor. Coating applied is of proper thickness for insulation requirements.

Single Pass Boring—Last operation prior to final assembly is the boring of the stator to provide proper clearance for the rotor. This machine, Fig. 3, was developed especially for this process by Reliance tool designers. It takes a cut on inside of stator to make it concentric with rabbet fits on each end. Two cutting tools are used with roughing tool set 3/16-inch ahead of finishing tool. The whole job is done in a single pass with chips and varnish dust being removed continuously.

Separate boring heads are used for the gap diameters of each size motor (from 1 to 20 horsepower), and a special indicator cuts changeover time to a minimum. Roughing tool is brought up against the indicator bar until it reads zero and finishing tool until indicator reads 0.003-inch. Tools are then tightened and machine is ready to start taking cuts.

Shafts for alternating current rotors and direct current armatures are turned from hot rolled bar stock on Monarch lathes with Bailey contour controls. Templates are used for taking cuts on standard sizes of shafts, enabling semiskilled operators to be used for this production work.

Fig. 4—Drilling of eight holes required for anchoring pole pieces in frame of direct-current motor is done simultaneously by individually-controlled motors. Indexing of machine enables remaining half of holes to be drilled

Pressure Rotor Casting—Casting of rotor bars, short circuiting rings and fan blades in one integral section is performed in a 60-ton press, Fig. 5, designed and built by Reliance's tool engineering department. Laminations previously pierced on notching presses or with multi-slot dies in Minster presses are held in alignment on an arbor by an internal keyway, placed in molds, and swung into the air-operated press containing a reservoir that holds a measured quantity of molten aluminum. A safety door with interlocking control is closed, and a pushbutton depressed to clamp the mold in place. A second pushbutton actuates the lower cylinder, forcing the molten aluminum upward into the mold under pressure ranging up to 750 pounds per square inch. Pressure is maintained and a blower is used to expel fumes as the molten metal chills.

After casting, mold is forced out of the press by a continuing upward movement of the lower cylinder, the upper cylinder having been retracted. The mold then goes for removal to a power operated stripper, which is another "home-grown" machine. Bottom and top molds are separated from the casting and arbor is pushed out in a series of operations which are actuated by a single pushbutton control. Castings are then transported to a keyseater machine where a groove is cut for the key which secures laminations to shaft. Shafts are then pressed into place, checked and straightened, and outside diameter is turned down to a smooth surface. In special cases the cast rotor is annealed by being rotated slowly while heat is applied from a battery of gas torches.

Completed rotors and stators are assembled and tested prior to packing for shipment. They are given a no load test in which the voltage, amperage, wattage and speed are checked. Then the voltage, amperage, wattage and torque are measured in a locked rotor test which checks for basic defects.

Direct Current Motors—Direct current motors in sizes up to 5 horsepower have their frames fabricated in the same way as alternating current type. Heavier motor shell castings are purchased and feet are then welded on to the shell.

All the holes for fastening pole pieces are drilled in one setup with a frame drilling unit called an Octopus. This machine, Fig. 4, uses eight drills located radially and powered by individual electric motors. Since these motors are controlled individually by an adjustable speed drive made by the company, a wide range of speeds is available to meet varied drilling conditions. One half the holes are drilled in the first position, then the machine is indexed and the remaining holes are drilled.

Holes in the pole pieces are drilled in reference

Fig. 5—Rotor bars, short circuiting rings and fan blades are cast in one integral section in a 60-ton press designed and built by the company

to the holes drilled in the frame, and field coils are put in place. Application of insulating varnish on the field coils is by a conventional dipping and baking process.

Coil Forming—Armature coils for motors up to 5 horsepower are wound on a semiautomatic Chapman winding machine. Larger coils are wound in Cleveland presently on a machine developed by the tool department which forms hairpin coils semiautomatically. A similar unit is planned for installation in Ashtabula soon. The operator pulls wire off a spool and into position. Machine then forms the coil and operator cuts it to length.

Commutators are made at the Ivanhoe plant and shipped to Ashtabula where they are assembled with armature laminations on sleeve of shaft. Coils are fastened to commutator by a dip soldering method in which the commutator goes into a well and all connections are soldered at one time. A machining operation removes all solder from face of commutator and cuts it to proper size. Mica is undercut to a depth of 3/64-inch on a machine that operates like a milling machine. Indexing is manual and copper is cut slightly to prevent forming a mica feather edge which would damage the brushes. Armature balancing is done on a Gisholt balancing machine which shows need for and amount of balancing needed.

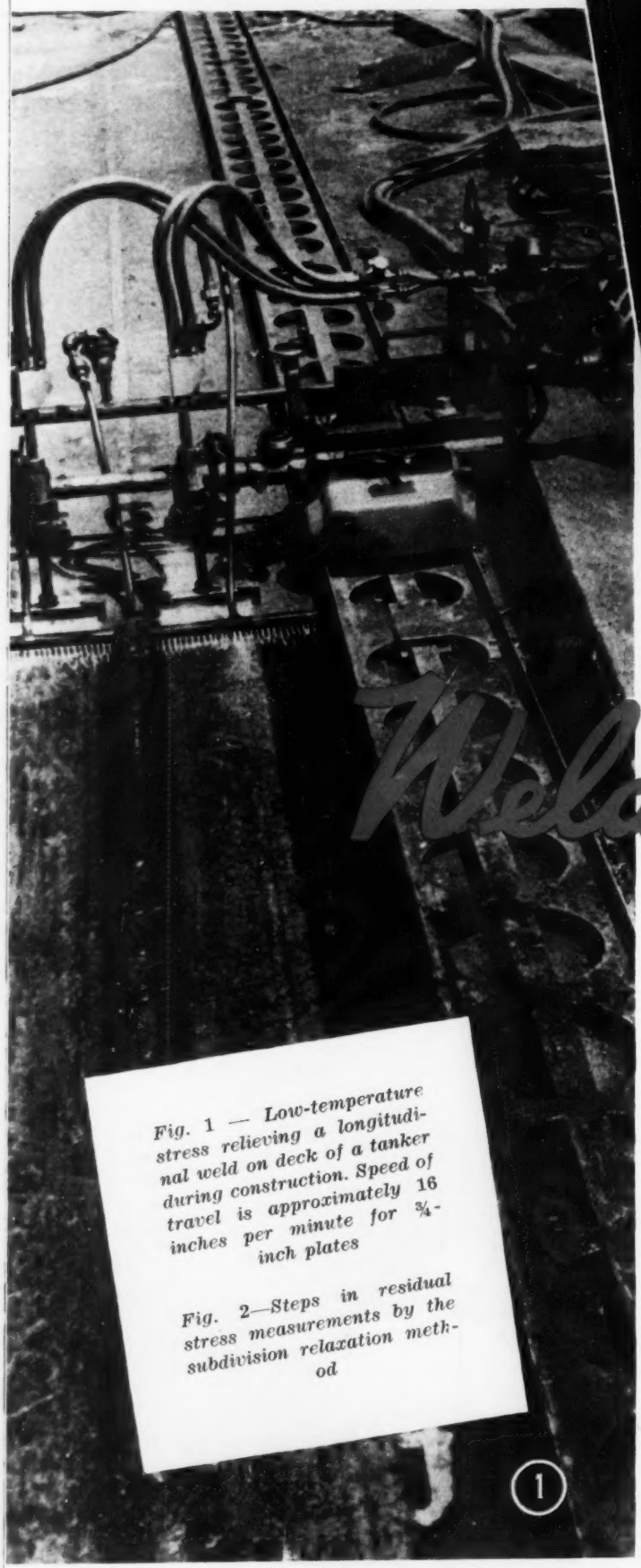


Fig. 1 — Low-temperature stress relieving a longitudinal weld on deck of a tanker during construction. Speed of travel is approximately 16 inches per minute for ¾-inch plates

Fig. 2—Steps in residual stress measurements by the subdivision relaxation method

By T. W. GREENE
Engineer
The Linde Air Products Co.
New York

Welding Stresses By Low-Temperatur Pr

FOLLOWING extensive investigation and research, within the past 2 years a new method of stress relieving was developed and applied to large ocean-going ships and pressure vessels and to large welded structures in the field. Because the stress relieving is done at temperatures of approximately 350° F, the method is designated as controlled low-temperature stress relieving.

It has been recognized that high residual stresses of near yield point value are developed in the weld metal by all conventional methods of welding and for this reason stress relieving has been generally accepted as necessary to eliminate or reduce those stresses in welded structures such as boiler drums and pressure vessels. Conventional procedure consists of evenly heating the entire structure or section in a furnace to a temperature of 1100 to 1200° F. This method is effective, yet it is also very expensive, requires large furnaces and cannot be applied to very large structures such as ships and large storage tanks.

To assist in understanding the controlled low-tem-

From data presented by the author before the 50th anniversary convention of the International Acetylene Association, Detroit, May, 1948.

Effective and practical method of eliminating high residual welding stresses, or reducing them to negligible values, without distortion or deformation, is offered by fast, low temperature process. By heating plate on both sides of the weld to 350—400°F, correlated with proper cooling, the weld is temporarily strained and actually proof-tested

...s Dissipated

...atur Process

perature method of relieving residual stresses, these stresses are usually classified into two types. One is called "reaction stress" and the other, for want of a better name, "residual stress". In this article, the term "residual stress" is limited to stresses in and immediately adjacent to the welded joint.

Mechanical Stress Relief—Yield strength stresses lengthwise in a weld correspond to an elastic strain of about 0.0015-inch of length. They are present only because of the tendency toward a difference in length between the plate material that was not heated and the weld metal. Stress relief can be accomplished merely by eliminating this tendency toward length difference. If the weld could be separately stretched so that when the load was released the weld would be permanently elongated to equal the normal length of the adjacent plate, there would be no stress existing between the two portions of the assembly.

Since the weld metal is already stretched to the yield point, any further stretch will be plastic. Longitudinal tension loading of the entire structure in the vicinity of the weld would cause plastic stretch in the weld even though the stretching of the plate did not exceed the elastic limit. Upon release of such a stretching load there would be a change in the length relationship because the plate material would return elastically to its original length, while the weld metal, which had undergone plastic flow during loading, would now not have as much tendency to shorten the adjacent plate.

Stress in the weld upon removal of the load would thereby be reduced by an amount nearly equal to the stress originally applied to the structure.

If, by applying heat, the plate material adjacent to the weld could be expanded lengthwise an amount corresponding to the strain in the weld (0.0015-inch per inch of length) while the weld metal was kept at normal temperature, the weld metal would be stretched by an amount nearly equal to the plate expansion.

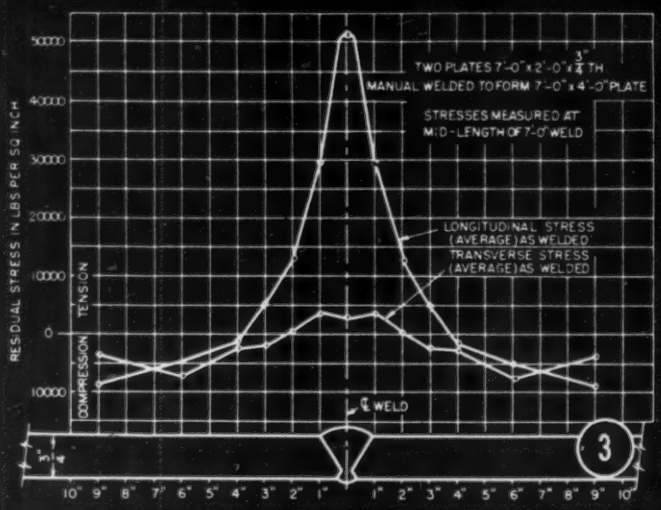
This stretch in the weld metal would be plastic and the weld would no longer exert the same contraction pull on the plate material which would assume its normal length upon cooling. This simple operation of changing the length relationship by thermal loading would release the longitudinal stress in the weld. The change in length required for releasing usual weld stress can be accomplished by a temperature differential between plate and weld of about 250° F. In practice it is impossible to keep all of the applied heat away from the weld, so that the temperature of the plate must be raised to about 300° above the original temperature or to 350-400° F maximum for average ambient temperatures.

This analogy between low-temperature stress relieving and mechanical stress relieving is not exact because the structure each side of the weld is not heating for the full length of the weld all at the same time. In low-temperature stress relieving, there is no observable over all lengthening of the structure or of the weld either during of after the treatment. Results are accomplished by inter-action between progressively-heated increments of plate and adjacent increments of cooler weld. This action may be thought of as a reversal of the kind of action between increments of weld and plate that produced the original welding stress.

Progressive Heating in Practice—In practice, progressive heating is accomplished by moving oxyacetylene blowpipe flames parallel to and on each side of the weld to provide a moving zone of heat. The method can be applied in production to any size and almost any type of structure. One application is shown in Fig. 1. In all the accompanying illustrations it will be noted that water or air-water sprays are impinging on the plate approximately 6 inches behind the advancing heating flames. This cooling serves two functions: It takes away all the surplus heat after the stress relieving has been accomplished, localizing the application to the seam being treated and preventing any possible expansion, buckling or distortion of the plating. By far the more important function is to assist and supplement the expansion forces set up by the heating.

Objective of the stress-relieving operation is temporarily to expand the plate on both sides of the weld differentially in relation to the weld. If the spray is properly located and correlated with the heating, it will rapidly cool the plating and cause it to contract behind the heated area. This contraction will materially assist the expansion and forces set up in the area being heated. This supplementary correlated cooling permits full reduction of residual weld stresses without overheating or upsetting the heated area and without distortion, dimensional change or imposition of residual stresses elsewhere.

Plan and Method of Investigation—Before the effect of any stress-relief measure was investigated, some standard practice had to be set for the determination of stress. Standard-sized plates and welding procedures had to be adopted to insure uniformity. The SR-4 electrical resistance-strain gage was adopted for all measurements. These gages are easy to use and yet extremely accurate. They are avail-


RESIDUAL STRESS IN LBS PER SQ INCH
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COMPRESSION
TWO PLATES 7'-0" x 2'-0" x 3/4" TH MANUAL WELDED TO FORM 7'-0" x 4'-0" PLATE
STRESSES MEASURED AT MID-LENGTH OF 7'-0" WELD
LONGITUDINAL STRESS (AVERAGE) AS WELDED
TRANSVERSE STRESS (AVERAGE) AS WELDED
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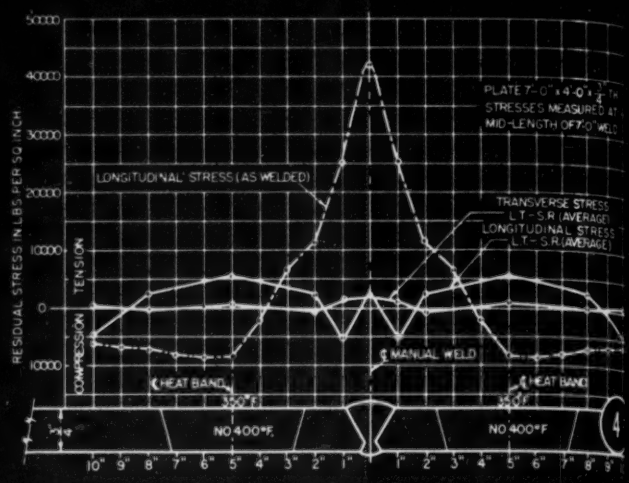


Fig. 3—Residual stresses as-welded plate MB-¾-S₂

Fig. 4—Residual stresses after low-temperature stress relieving MB-65-2

Fig. 5—Residual stresses after low-temperature stress relieving USCG-65-2

able in short-gage lengths, which makes them ideal for measuring strains where stress concentrations exist or where stress gradient is high.

Plates 2 x 7 feet were adopted as standard. Two of these were welded together without restraint to form one plate 4 x 7 feet. Both open shielded manual arc welds and automatic submerged-melt welds were investigated. Originally, all plates were furnace stress relieved before welding to eliminate rolling stresses and to insure uniform results. This practice was omitted in some of the later plates, for it was found to have little effect on the result.

Standard-gage layouts were adopted so that all stress curves would be comparable. Gages were close enough together to pick up the stress distribution in the weld and adjoining plate, including the area heated in the stress-relieving treatment.

After test plates were welded, gages were cemented to the plate and waterproofed. Initial gage readings were then taken and the section of the plate carrying the gages was removed by drilling through a standard jig. The section was then subdivided into single-gage stations with a contour saw, Fig. 2. After the subdivision by sawing, all gages were again read. The difference between the initial and final readings at each station indicated the release of strain. A shortening of the steel as indicated by the gages shows relaxation of residual tension, and conversely a lengthening of the steel shows relaxation of compression. This is independent of any plastic flow that has taken place while the stresses were being formed during welding.

Residual Stresses As-Welded in Butt Welds—Fig. 3 shows the residual stresses in both longitudinal and transverse direction in typical manual butt welds as measured at the mid-point of 4 x 7-foot by ¾-inch weldments. Residual stresses were measured at the center line of the weld and at 1-inch intervals from the weld by the subdivision method previously described. In the tests, usually only the weld and the plate adjacent on one side were investigated, but in the curves the stresses in the plate on both sides are shown on the justified assumption of symmetry.

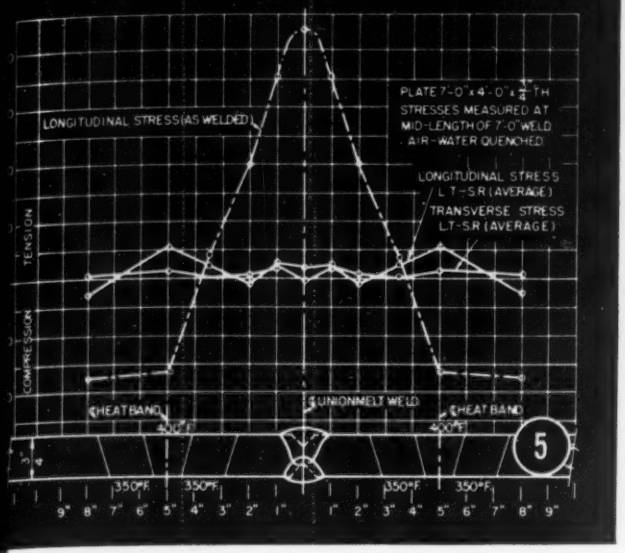
As can be seen, the critical highest residual stresses are in the direction longitudinal to the weld and almost invariably are between 40,000 and 50,000 pounds per square inch or the yield strength of the weld metal. Residual stresses transverse to the welds vary somewhat, depending upon the location along the weldment, but generally are relatively small.

Residual Stresses After Stress Relieving—Residual stresses in a typical manual butt weld after low-temperature stress relieving are shown in Fig. 4. This curve shows both the longitudinal and transverse stresses, and, for convenience of comparison, the longitudinal stress as-welded (average of three manual weldments used as standard for as-welded condition) is also shown. It will be seen that the high longitudinal residual stresses averaging about 43,000 pounds per square inch in the weld as-welded have been reduced to negligible value by the low temperature stress-relieving treatment. Further, the stresses transverse to the weld remain very low and the treatment does not impose any appreciable stress anywhere in the plate.

Fig. 5 shows a typical case of some tests made on Unionmelt welds which were made, using an air-water spray from a header 6 inches behind the advancing flames. This is a far more effective cooling application and is recommended wherever possible.

In all of these tests, the conditions of low-temperature stress relieving were practically the same. Two 6-inch wide heating tips were used on 10-inch centers, the center line of each tip being 5 inches from the center line of the weld. Speed of blowpipe travel was about 16 inches per minute for ¾-inch plate. A small jet of water was directed against the weld and either a small jet or spray of water from a header impinged on the plate 6 inches behind the advancing flames. The ambient temperature varied from about 40 to 70° F.

From the previous discussion of the theory of low-temperature stress relieving, it would be expected that many factors such as width of heating flames, location of the heated area in relation to the weld,



maximum temperature of heating, method of cooling and other variables, would influence the effectiveness of the application of the method. Within reasonable and practical limits, any heating beside the weld will reduce the high residual welding stresses and improve the stress condition as compared to the as-welded.

Obviously, however, there are certain optimum conditions that will give the desired maximum stress relieving and reduce the residual stresses in the weld to about zero value without imposing any undesirable stresses elsewhere, such as in the heated area. Economy of application, absence of distortion or dimensional change, and the practical need of narrowing the heating as much as possible to minimize interference had to be considered and investigated.

Location of Heated Area—It would be expected that the location of the heated area in relation to the weld would be a very important factor. If the weld or immediate adjacent metal were heated, little reduction would be expected; likewise, if the area heated were 1 foot or 18 inches from the weld, the effectiveness of the heating in straining the weld would be lost. The optimum condition is obtained with the center line of the heated area 5 inches from the center line of the weld.

Maximum Heating Temperature—Effect of maximum heating temperature was investigated with considerable care and thoroughness, as it was desired to effect the maximum reduction of residual stress at the lowest temperature. A chart illustrating the effect on both the weld and heated area, of the maximum heating temperature (in turn influenced by speed of travel) would show that for 300° F maximum heating temperature (21 inches per minute travel for ¾-inch plate), the residual stresses in the weld are reduced from 40,000-50,000 pounds per square inch as-welded to half these values or about 20,000 pounds per square inch. Heating to 350° F at about 16 inches per minute speed reduces the residual weld stresses to practically zero value.

Residual stresses in the weld are reversed with heating to 400° F (about 13½-inch per minute travel), and the weld is left actually under residual compression. But this higher temperature has a tendency to cause some upsetting in the heated area and induces some residual stresses in the plate on the top or heated side. Although these latter stresses are not high or harmful, they can be avoided. Latitude in temperature of heating and speed of travel is quite broad, certainly not critical, and can be controlled easily and practically. However, it is recommended that the speed be checked and occasional observations be made on the width and temperature of the heat bands with temperature-indicating crayons. It might be stated that the optimum maximum temperature of 350° F is applicable to all the plate thicknesses from ¼ to 1¼ inches.

Optimum Operating Conditions—The optimum conditions for stress relieving common commercial steel plates are given in the table for thicknesses of ½ to 1¼ in. Thicknesses from ½ to 1¼ in. have been rather thoroughly explored. For thicknesses of less than ½ in., the more efficient or quicker transfer of heat through the thickness with less lag of heating on the underside makes it possible to use much narrower heating bands with decided increases in speed of travel.

Stress Relieving Pressure Vessels—Of practical interest is the application of low-temperature stress relieving to pressure vessels. This has considerable appeal in stress relieving of tie-in butt joints made in the field joining section of pressure vessels and sections of high cracking towers that have been x-rayed and furnace stress relieved in the shops and shipped to field for final assembly.

Fig. 6 shows the low-temperature stress relieving of head seams of large 8 x 60-foot 4-inch propane tanks constructed of ASTM A-212 high-strength 70,000 boiler plate steel. A comprehensive investigation of the residual stresses in the girth and longitudinal seams of these tanks of ⅞-inch thickness showed the residual stresses in the "as-welded" state ranged from 45,000 to 55,000 pounds per square inch. Low-temperature stress relieving without distortion or deformation reduced these welding stresses to negligible intensity, in fact often transformed the critical tensile stresses to slight residual compression.

Stress Relieving Huge Welded Tank—Welding and stress relieving the outer lower tank or water tank of a 10,000,000 cubic foot multiple-lift gas holder is of particular interest because it is the largest welded tank in the world. This tank is 38 feet 2 inches high and is nearly 1/5-mile in circumference (276 feet 6 inches in diameter), Fig. 7. Lower course of the tank is slightly less than 1⅞-inch thick. Thickness is reduced with each course to a minimum of ½-inch.

OPTIMUM OXY-ACETYLENE OPERATING CONDITIONS FOR LOW-TEMPERATURE STRESS RELIEVING

Plate Thickness, In.	Approx. Speed of Travel In. per Min.	Type	Two Blowpipes Distance from Weld	Width of Heat Bands** 350° F.	400° F.	450° F.	Location of Cooling Spray
½	24	E6*	5 in.	4-5 in.	None	None	6 in.
⅝	20	E6*	5 in.	5-5½ in.	None	None	6 in.
¾	16	E6*	5 in.	5-6 in.	Trace	None	6-8 in.
⅞	12	E6*	5 in.	5-6 in.	Trace	None	6-8 in.
1	10	E6*	5 in.	5-6 in.	1-3 in.	None	6-8 in.
1¼	9	E6*	5 in.	5-6 in.	1-3 in.	None	6-8 in.

Distance of tip from plate can vary from ⅛ to 1⅛ in.
* Special drilled oxy-acetylene 6-in. wide flame-priming heads.
** The maximum temperatures of the heat bands are based on ambient temperature or steel temperature of 50 to 90° F. In the winter, when steel temperature may be 10 to 40° F, maximum heating temperature should be 50° F lower. This is accomplished at the same speed of travel.

After careful consideration of all problems of field welding thick plate in such large and important structures, it was decided that the safest, soundest and most constructive engineering basis for welding would be to apply the API—ASME Code. Under this code, when high quality steel or boiler plate is used instead of structural or tank steel, the design joint efficiency is increased from 80 to 85 per cent. When the welds are stress-relieved, the allowable joint efficiency is increased another 5 per cent. When the welds are x-rayed, a further increase of 5 per cent is allowed. In other words, when boiler plate steel is used in conjunction with both stress-relieving and x-raying, a joint efficiency of 95 per cent can be used instead of 80 per cent in the design of ASME vessels.

In building this tank, boiler plate steel, ASTM A-70, was used throughout. The three lower courses where the thickness exceeds 1¼-inch were x-rayed and stress-relieved and a joint efficiency of 95 per cent was used in the design. For the upper courses, less than 1¼-inch in thickness which were not stress-relieved or x-rayed, the joint efficiency was considered as only 85 per cent. It might be mentioned that if boiler plate, x-raying, and stress-relieving had not been used, the design would have required a plate thickness for the lower courses of 2 1/16-inch instead of 1 49/64-inch, which was used in this tank.

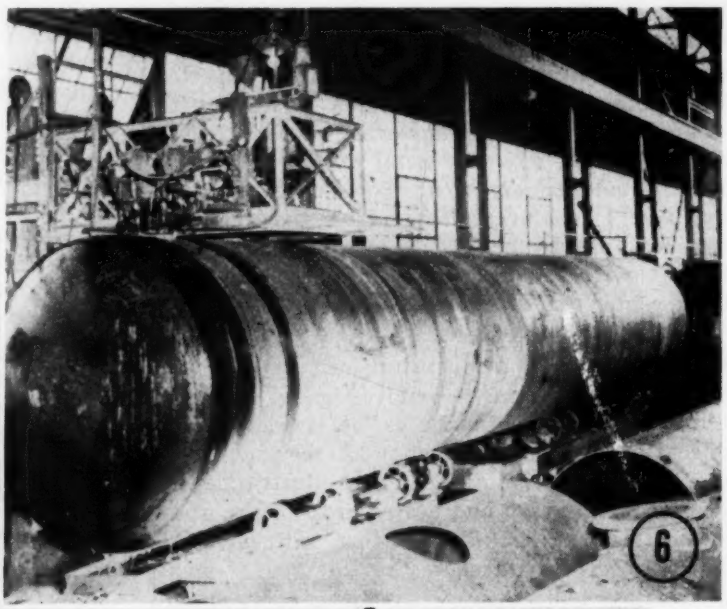
Residual Welding Stresses in Thick Plate—Since the maximum plate on the water tank of this large gas holder would be nearly 2 inches thick and since a considerable amount of welding would be involved in joining the plates in excess of 1¼-inch thick, it was necessary, first, to determine the exact magnitude of the residual stresses in such thick plates, and second, to determine the effectiveness of low-temperature stress relieving in reducing them.

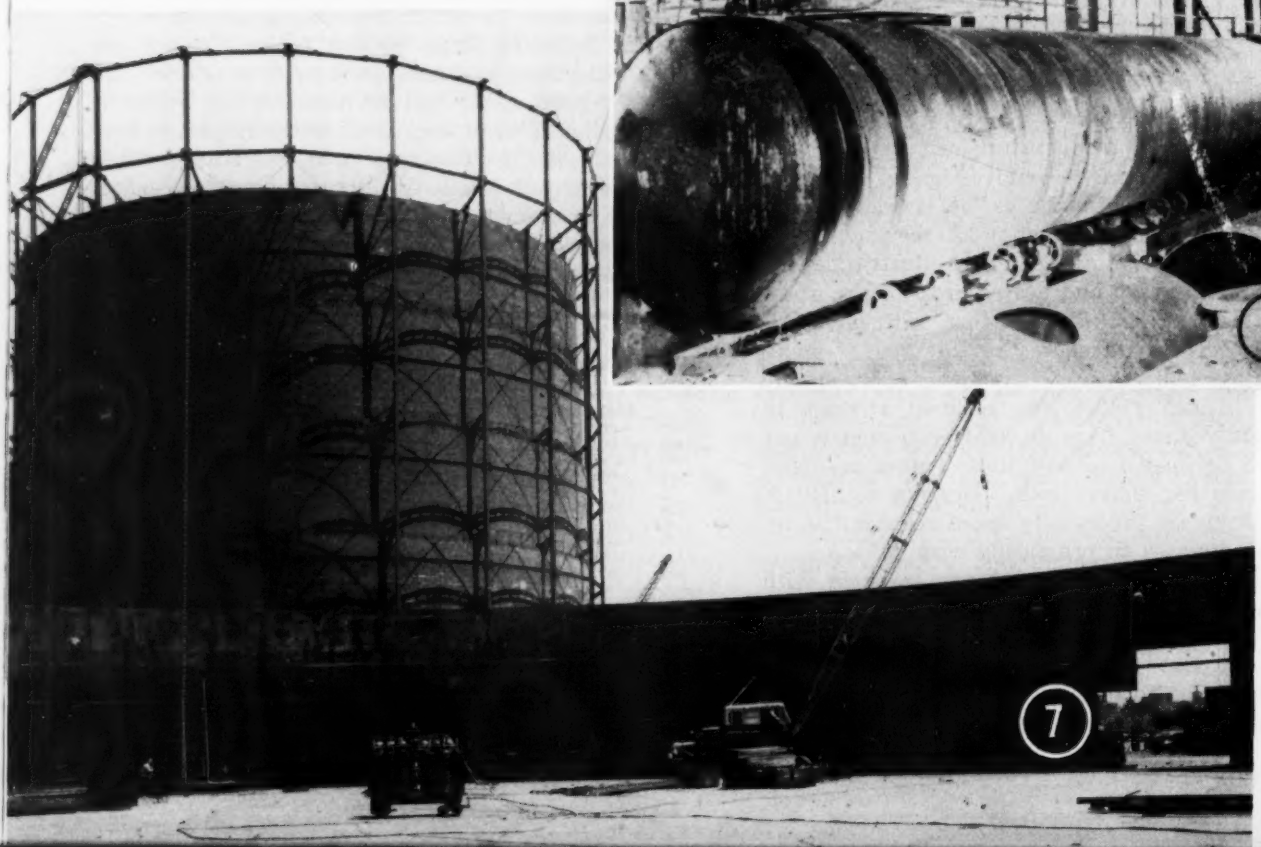
In low-temperature stress relieving, the controlled heating treatment for relief of the residual weld stress is progressively applied at 350-400° F from one side for plate thicknesses up to 1⅜-inch. In heavier plates, because lag of heat penetration through the thickness adversely affects the desired control for full relief, it is necessary to apply the heating treatment from both sides simultaneously. Treatment of 2-inch plate is in effect treatment of two 1-inch plates.

Investigation showed that low-temperature stress relieving reduced the high longitudinal stresses of 65,000 pounds per square inch in the "as-welded" state to zero values or to slight residual compression. Transverse stresses which in these thick plates were unusually high, were reduced to one-third the as-welded values. It is believed that the stresses in the direction of thickness not measured in this investigation were also reduced a proportionate amount as would be expected from theoretical consideration. Optimum speed for treatment appears to be about 8 inches per minute—slower speeds simply increase the residual compression in the longitudinal direction.

Fig. 6—Low temperature stress relieving welded seams of large 8 foot by 50 foot 4 inch propane tank sconstructed of ASTM A-212 high strength boiler plate

Fig. 7—Interior view of water tank for 10 million cubic foot holder. Reported to be the largest welded tank in the world, diameter of the tank is 276 feet 6 inches; first course is 1 49/64-inches thick

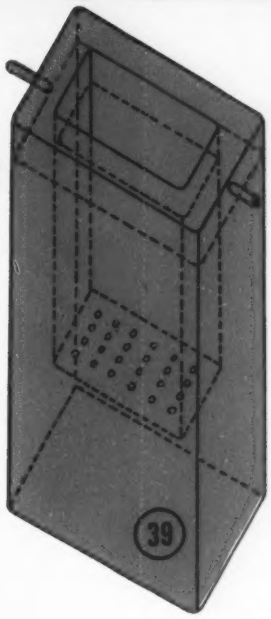




Organic Finishes

For Metal Products

Introducing the subject of testing organic finishes, part seven of series covers salt spray, moisture, alkali, stain and grease resistance, hardness and distensibility tests

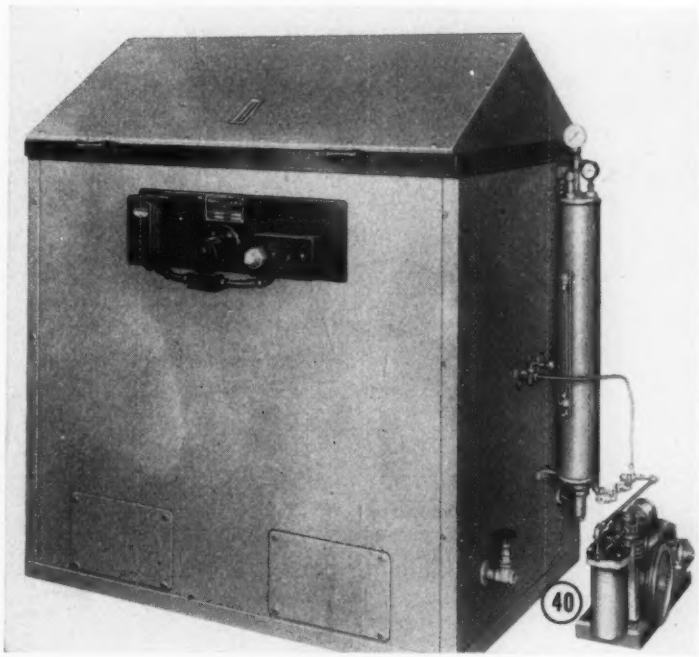


Previous articles in the current organic finishing series appeared in the following issues of STEEL: May 17, p. 77; May 31, p. 56; June 14, p. 96; June 28, p. 81; July 12, p. 97; July 26, p. 71.

ACCELERATED testing of organic coatings for metal products has become increasingly important as the users of these coatings better recognize the functions and possibilities of the finishing materials. The accelerated testing of organic coatings consists of an evaluation of the finishing material for its appearance, application properties, economy and durability, or useful life on the product. Various physical tests and test methods have been developed for the evaluation of organic coatings.

Most of these tests seek information on such factors as hardness, distensibility, adherence, resistance to stretching, impact or abrasion. Many other specific tests may be required for a particular application of a finish but they are not of general interest. Accelerated tests, preferably, should be made on a comparative basis by using a finish of known field performance as a control to assist in interpretation of the results obtained on new materials.

After selecting, by accelerated tests, what appears to be a good finish, field testing on products is recommended for positive proof that the finish is fully satisfactory. As a satisfactory finish for a metal product must be a "balanced" finish, that is, one in which an outstanding property is not gained at the sacrifice of other necessary properties, the accelerated tests used for evaluation must be sufficiently wide in scope to cover all important properties. The individual tests do not cover all the important finish properties, but collectively they represent the



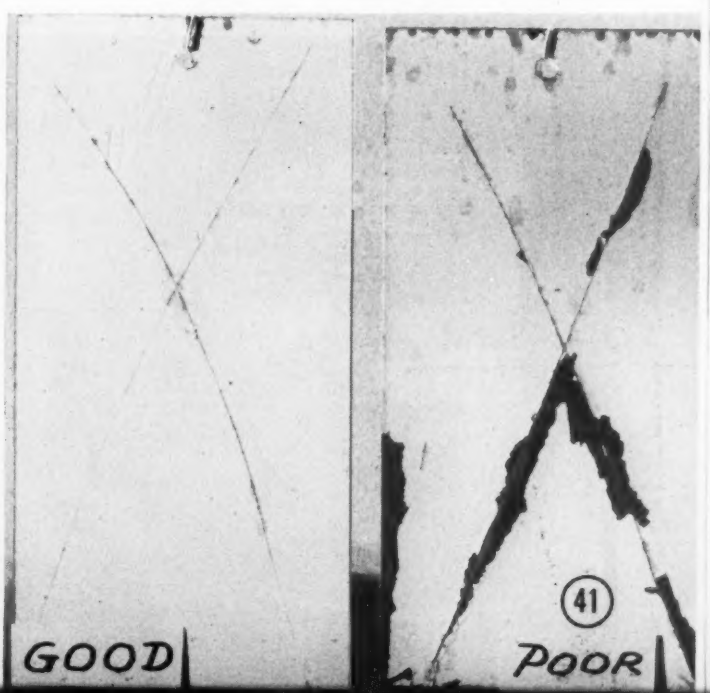
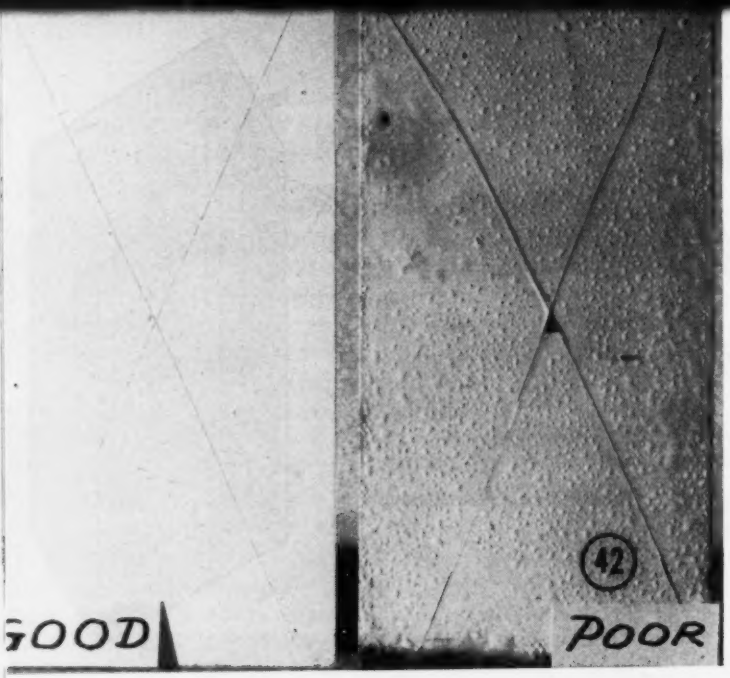
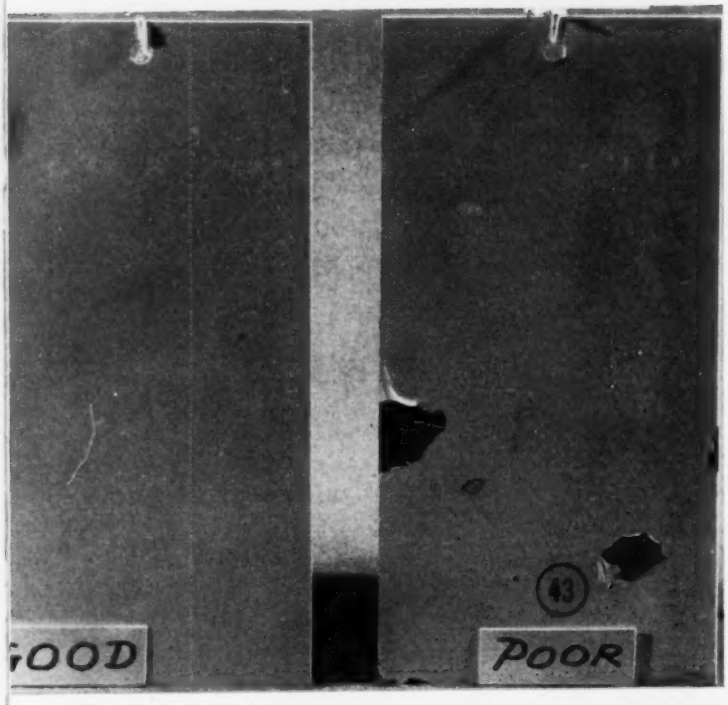


Fig. 39—Degreasing apparatus for test panels. Courtesy Canadian Chemistry and Process Industries

Fig. 40—Commercial type of salt fog corrosion test equipment. Courtesy Industrial Filter & Pump Mfg. Co.

Fig. 41—Appearance of satisfactory and unsatisfactory salt spray test panels. Courtesy General Electric Co.





"tools" with which the finish can be measured.

Preparation of Panels—It is important that test panels be carefully prepared for the application of the finishing material. A simple piece of laboratory apparatus was recently described[55] which degreases test panels very efficiently. Furthermore, it can be constructed from readily available materials at a cost of only a few cents. The device, sketch of which is shown in Fig. 39, consists essentially of a small upper chamber, into which the panels are placed for cleaning, and a large lower one in which trichlorethylene is boiled. The bottom of the upper chamber is perforated with a large number of holes through which the solvent vapor passes to reach the panels. These holes serve to return the condensed solvent to the lower chamber. At the top of the upper chamber is a water jacket which condenses any vapor that does not condense on the panel.

Materials used in the construction of the panel cleaner consist of a square gallon can, which serves as the lower chamber, and a square quart can soldered inside the gallon can, which serves as the upper chamber. The water jacket is formed at the top of the device by soldering two pieces of light sheet metal, a distance of 1 inch apart, into the space between the quart and gallon cans. Two short lengths of copper tubing, soldered as indicated, Fig. 39, serve as attachments for rubber tubing.

For use, about one liter of trichlorethylene is poured through the small upper chamber into the lower, the device placed on the electric hot plate and water run through the jacket. Panels are held with tongs, in the vapor chamber, until completely washed with condensed solvent, and on removal are ready for coating. This method is reported to remove all traces of oil and grease; there is no time lost in waiting for the panels to dry, since the solvent evaporation from the hot panel is rapid. All fire hazard is eliminated by the use of non-burning trichlorethylene, and solvent loss by evaporation is very small due to the effectiveness of the water jacket.

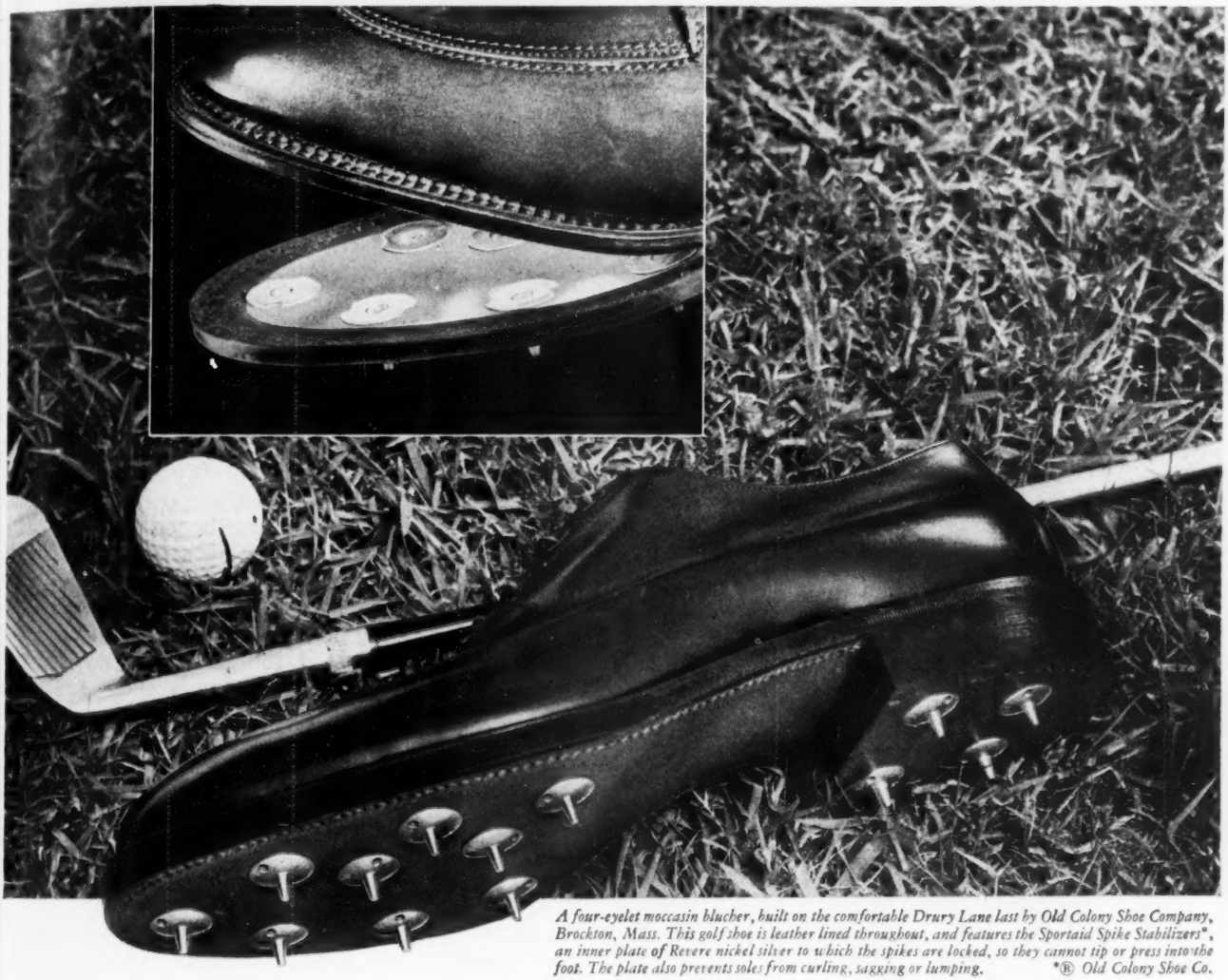
Other methods of panel cleaning may be used. One method that has been recommended[6] is that the metal panel be washed thoroughly with an organic solvent, such as lacquer thinner, to remove oils and greases, followed by a second wash with a clean lacquer thinner, and finally rinsed or wiped with a mixture consisting of 75 per cent ethyl alcohol and 25 per cent distilled water, followed by drying. When the finish is to be applied to phosphate or other coated surfaces, panels with good representative coatings should be used and precautions taken to see that test panels have been rinsed properly. In such cases it is desirable to run the test panels through

Fig. 42—Appearance of satisfactory and unsatisfactory humidity test panels. Courtesy General Electric Co.

Fig. 43—Typical good and poor test panels after alkali resistance test. Courtesy General Electric Co.

Fig. 44—One form of commercial test equipment for accelerated tests on finishes. The Atlas Weather-O-Meter is an accelerated weather machine for operation 24 hours per day

A CASE IN WHICH AN "EXPENSIVE" METAL PROVES MORE ECONOMICAL AS WELL AS BETTER



A four-eyelet moccasin blucher, built on the comfortable Drury Lane last by Old Colony Shoe Company, Brockton, Mass. This golf shoe is leather lined throughout, and features the Sportaid Spike Stabilizers®, an inner plate of Revere nickel silver to which the spikes are locked, so they cannot tip or press into the foot. The plate also prevents soles from curling, sagging or lumping. *® Old Colony Shoe Co.*

IT is the most natural thing in the world for engineers and purchasing agents to check prices of materials, and when they find that one costs more per pound than another, to conclude, in the absence of other information, that one is more expensive than the other. However, it is often the case that much more than price is needed to determine which is actually the most desirable as well as economical. Take these golf shoes, for example.

Golfers for years were annoyed by spikes that tipped, and dug into the feet instead of the fairway. The Old Colony Shoe Company did something about this. It developed a golf shoe with an inner steel plate to which the spikes are anchored. To prevent rust, the steel was cadmium plated. Golfers went for the shoe. They still do, but what they do not realize is that now the plate in their shoes is made not of steel but of Revere nickel silver, spring grade, which is inherently rust-proof and needs no plating whatever.

In making this switch, Old Colony was adhering to its customary policy of making the best shoes it knows how to turn out. Nickel silver costs more per pound than steel, but it was selected because it provides absolute assurance that the plate is equal in quality to the rest of the shoe materials. However, when the cost figures were in, it was discovered, surprisingly, that the nickel silver plates cost less than the steel ones, due to elimination of the plating and associated operations . . . Naturally, before the final decision was reached to use nickel silver, careful tests were made. Revere cooperated in these and was delighted when the metal proved itself on the basis of service. That it also has the advantage of economy is just so much the better . . . Quite often it is true that cents-per-pound are not as important as quality service and cents-per-finished-part. Revere is always glad to collaborate in studying such problems.

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the factory unit in which the metal products will be phosphated, prior to finishing. After preparation for finishing, the panels should not be contaminated in any way, and handled at edges by means of hooks or with clean, dry canvas gloves.

Panels made from 22 gage cold rolled satin finish steel, size 4 x 8 inches have been found satisfactory for testing finishes to be used on appliances.[56] The organic finishing materials should be applied in a manner to simulate production conditions under which the finish will be used and to a film thickness in agreement with that to be used on the product. The finish for appliances such as refrigerators, washing machines, range parts etc., is generally applied to a total minimum film thickness of 2 mils for satisfactory durability and appearance. The finish should be baked in accordance with the manufacturer's recommendations, and oven temperatures carefully controlled.

One procedure that has been recommended is that panels be sprayed on a rack which holds them at a 45-degree angle. This gives a truer picture of the ability of the film to build without sagging than if the panels were sprayed in a horizontal position. Before baking the panels, the solvents are allowed to flash off for five to ten minutes. After baking, the coated panels should be allowed to age for 48 hours before any tests are made.

Salt Spray Test—The salt spray test is commonly used for organic finish testing and consists of atomizing a 20 per cent salt solution, maintained at a temperature of 90 to 95° F, allowing the salt fog to pass over the test samples. A standard salt spray box meeting ASTM requirements should be used. The salt spray test, typical commercial type of which is shown in Fig. 40, is valuable for comparing the efficiency of phosphate and other coatings under organic finishes.

In testing organic finishes to be used on appliances at the Bridgeport works laboratory of the General Electric Co.[56], an X is scratched in the center of the finished panel cutting through the coating and exposing the bare metal, prior to the time the panel is hung in the salt spray cabinet. Panels are left in the test for 200 hours and examined daily during this period for signs of deterioration. At the end of this 200-hour period, the panels are removed, washed, dried, and rated. The rating is made on a basis of ten being perfect. Failure in salt spray usually shows up in the form of corrosion creepage back from the scratch in the panel, and from the edges of the panel. Grading is done by subtracting one point from the ten for each 1/16-inch creepage. Usually not more than 1/16-inch creepage is allowed. Shown in Fig. 41 is the appearance of satisfactory and unsatisfactory salt spray test panels based on the General Electric test conditions.

Moisture Resistance Test — Exposure to 100 per cent relative humidity in the vicinity of 100° F or

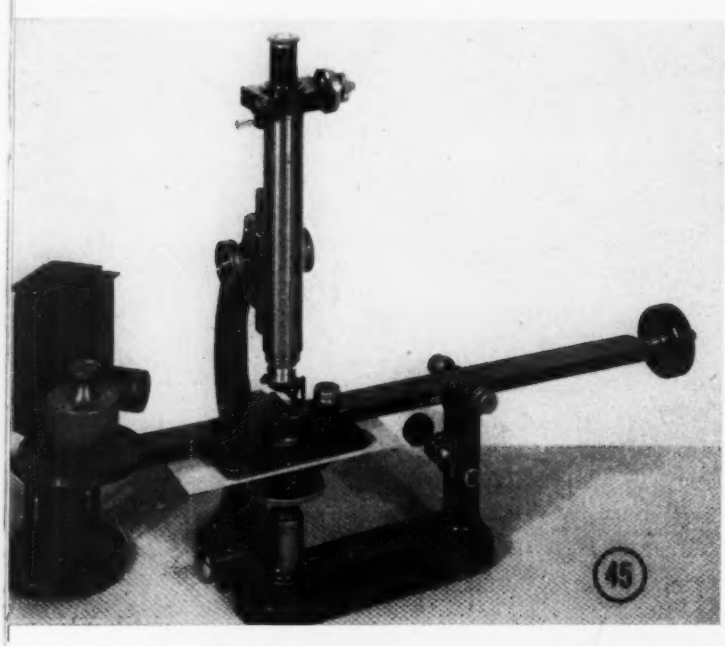
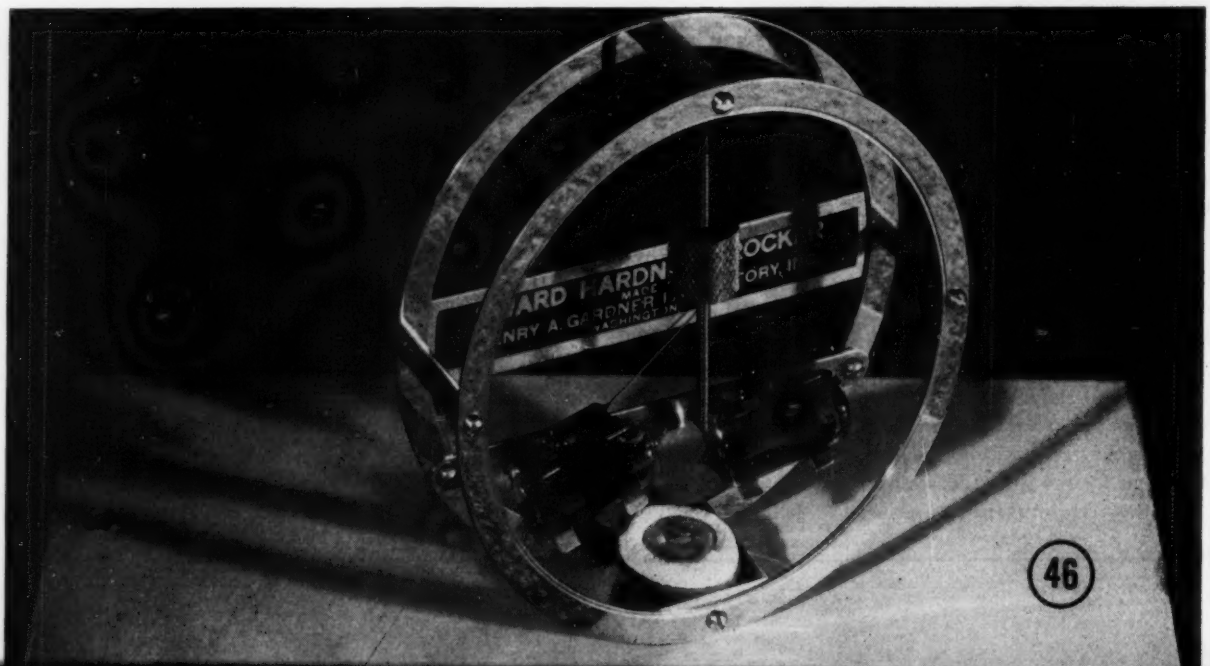
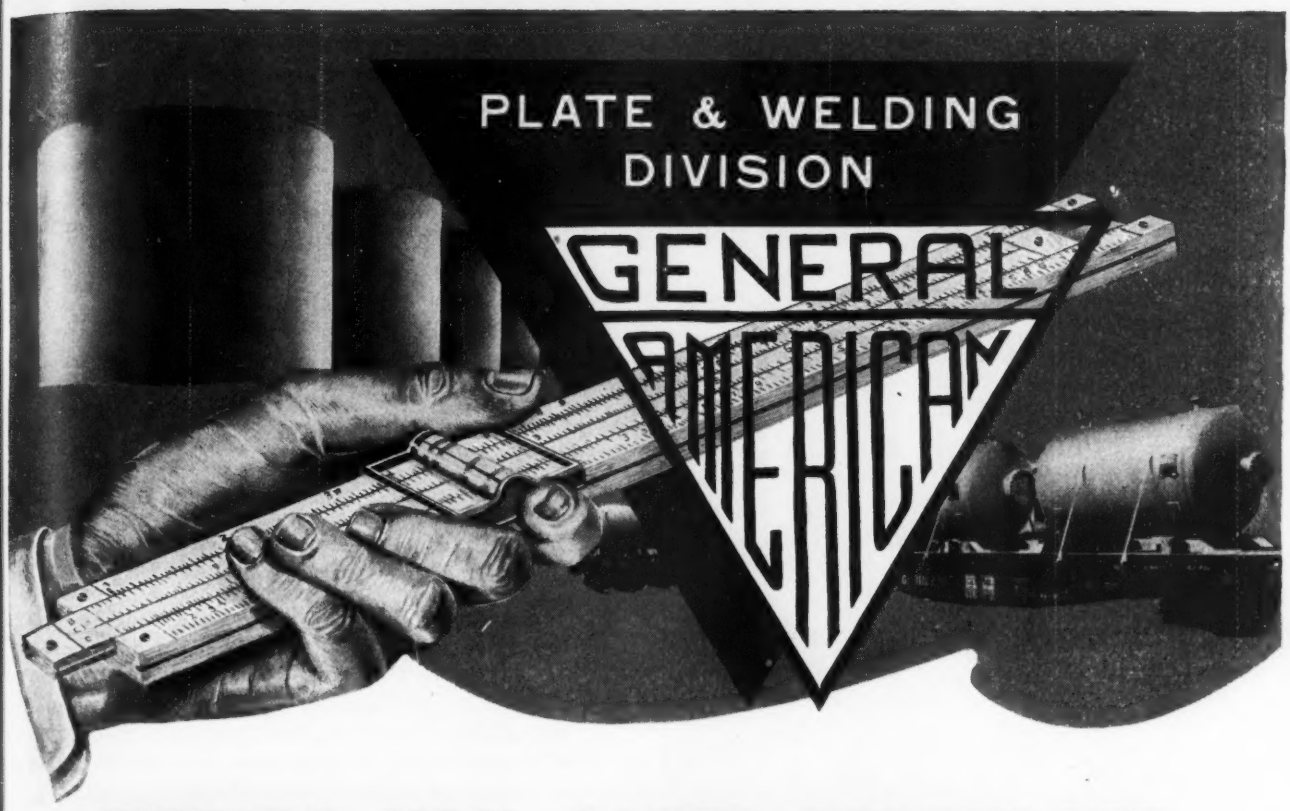


Fig. 45—Pfund indentor for hardness test of organic finishes. Courtesy Bell Telephone laboratories

Fig. 46—Application of the Sward rocker to measurement of hardness of organic finishes





THINGS YOU CAN'T CALCULATE ON YOUR SLIDE RULE

Engineering problems solved in the laboratory are problems no longer — yet in steel and alloy plate fabrication there are factors where the right answers yield more readily to common sense than to the slide rule.

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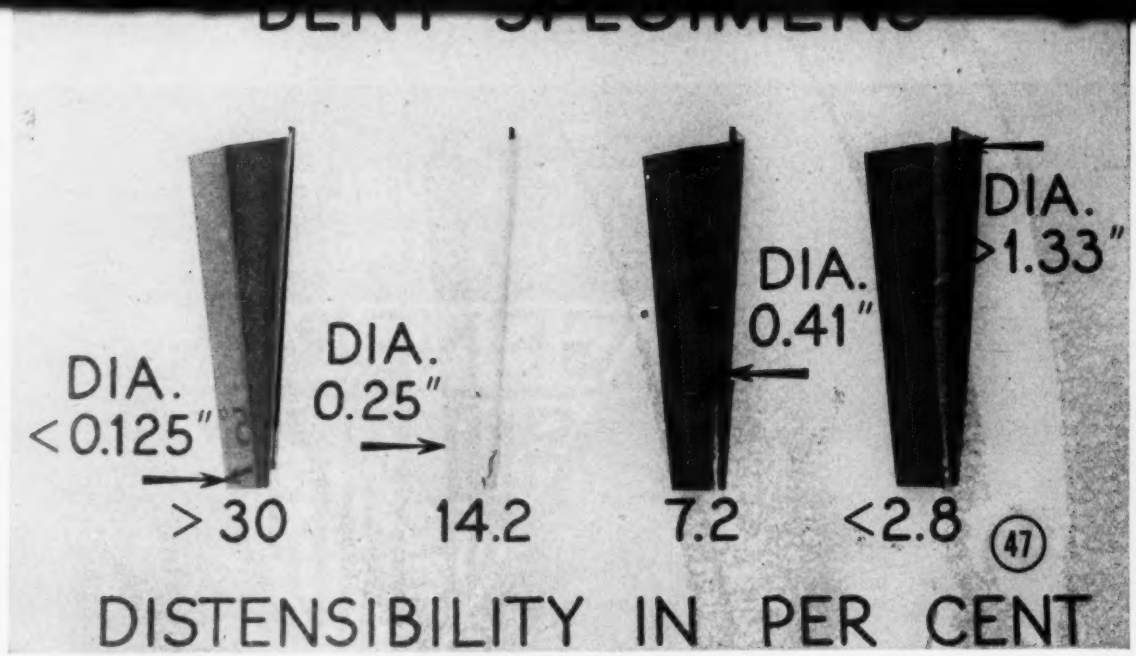

Fig. 47—Bent specimens from the conical mandrel test as carried out in the Bell Telephone laboratories for measuring the distensibility of organic finishes

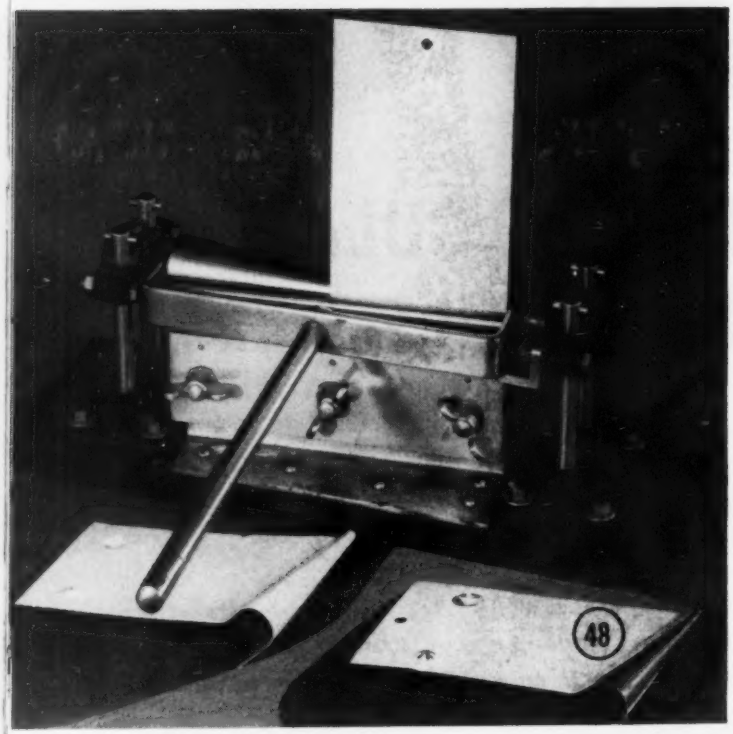

Fig. 48—Conical mandrel used in the General Electric appliance finish test to determine the ability of organic finishes to stretch without separating from the base metal

immersion in water at 100° F is used for determining the moisture resistance of organic finishes. The humidity test is conducted in a room or chamber in which the relative humidity is maintained at 100 per cent through the use of live steam or an immersion heater in a tank of water. The temperature should be maintained at 90 to 100° F and air circulation provided to maintain uniform conditions throughout the chamber.

Some tests are so arranged that the test panels are mounted on platens or pipes through which water is flowed so that they are cooled just sufficiently to cause constant sweating. The water immersion test is made by immersing the test panels in a water bath maintained at 95-105° F. Water should be changed periodically. Generally, it is considered that the two tests give comparable results for film blistering, but the humidity test gives better results for under-film corrosion.

Panels should be examined at the end of 24, 48, 96, 250, 500, and 1000 hours for blister formation, under-film corrosion, adherence, softening and checking or cracking of the finish. It has been reported[6] that a finish that stands up for 1000 hours is satisfactory from the standpoint of moisture resistance for use on refrigerators. The moisture resistance requirements of finishes for other appliances are somewhat lower than for refrigerators. The humidity and water immersion tests are also very valuable for checking parts for contamination on surfaces before finishing such as finger prints, and other soluble contamination which will also cause blister formation.

In carrying out the humidity test in the General Electric appliance finish testing laboratory an X is scratched in the center of the finished panel, cutting through the coating to expose the bare metal, and the panels are hung in the humidity cabinet. This is a heated room, thermostatically controlled to maintain a temperature of 90 to 95° F and a relative humidity of 100 per cent. It is reported that panels are left in the room for 200 hours and examined daily during this period for signs of breakdown. At the end of 200 hours, the panels are washed, dried, and rated. Here, as in the case of the salt spray test, the rating is done on a basis of ten. The film is examined for blisters, dulling, and softening. A satisfactory finish should show no signs of failure after 48 hours and only a very slight blistering at the scratch after 200 hours. Shown in Fig. 42, are satisfactory and unsatisfactory humidity test panels after exposure under the General Electric test conditions.

Alkali Resistance Test—A test used to evaluate or-

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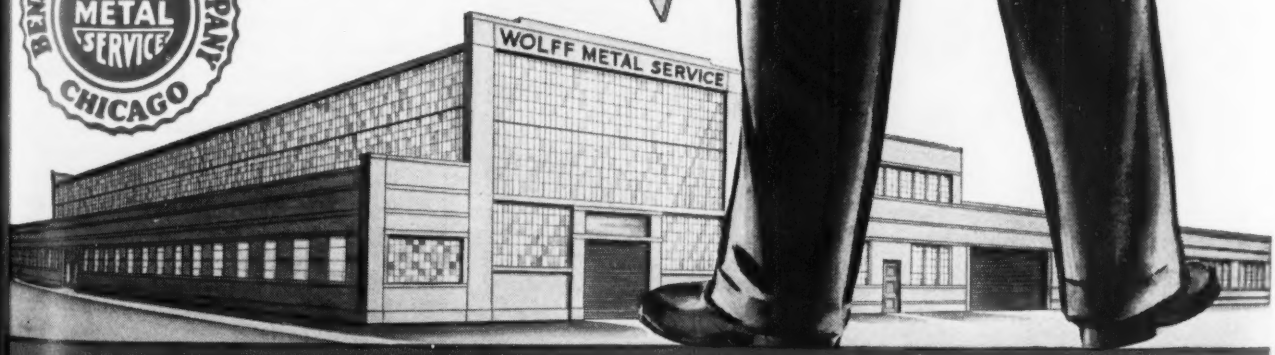

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ganic finishes for alkali resistance is to immerse test panels in a solution containing 1 ounce per gallon of trisodium phosphate at temperatures of 170 to 180° F for 24 to 48 hours. Finishes which show no more than slight attack after the above exposure have been reported to give satisfactory alkali resistance on home laundry equipment.

Alkali resistance tests are applied on finishes which are to be exposed to soap or other alkaline conditions in the General Electric appliance finish test laboratory. In carrying out the test the prepared panels are hung so that half the panel is immersed in a test solution maintained at 165° F. The panels are examined at regular intervals, and must withstand at least 48 hours of this exposure without being affected. The panels are generally left in the test solution for 100 hours; according to the standards of the General Electric test those which show any signs of failure after 48 hours are automatically rejected. Typical good and poor test panels are shown in Fig. 43. These panels are also rated on a basis of 10, subtracting for the following defects: Blisters, softening, discoloration, chipping, and dulling.

Stain and Grease Resistance Tests—Many finishes for metal products, particularly those used on appliances, must be able to withstand fruit acids, coffee, and various greases without staining or softening. A recommended procedure for carrying out tests for these substances consists in smearing the materials which are desired to be tested, as a thin film on different areas of the test panel, following which, the panels are placed in an oven at 100° F in a horizontal position. The panels should be removed from the oven at the end of 24, 48, 96 and perhaps 240 hours of heating and examined for staining or softening of the finish. A completely satisfactory finish should show no evidence of cracking or discoloration.

If the time allowed for the test is sufficient, the panels used in this test, or duplicate panels, should be stored in a dark chamber with 80 to 100 per cent relative humidity and air circulation. They should be examined at the end of 1 month, and again after 2 months and 6 months exposure for cracking and discoloration. In carrying out stain tests on such materials as coffee or tea, a desirable practice to follow is to place one cubic centimeter of the solution on the test panel, and cover with a small watchglass to prevent evaporation while being heated during the test period.

Color Retention Tests—Color retention tests should give an indication of the ability of an organic finish to retain its original color and gloss over a long period of time. Color retention of white finishes may be affected by many exposure conditions. There is no one test which reveals complete information. The initial color change in an organic finish, commonly called bleach after baking, can be checked by masking a portion of the panel and exposing for 2 hours to bright sunlight. After exposure the finish should be placed in a dark room free to air circulation for 24 hours and examined for the degree it has returned to the original color. Definite bleaching affects the color matching of metal parts in assembly, and may show up adversely as a contrast between protected and unprotected areas in display cases. A comparison of color retention under clean exposure conditions can be made by exposure under glass to sunlight for a period of 2 weeks, 1 month, and 2 months.

In carrying out the color retention test in the Bridgeport General Electric appliance finish test laboratory, test panels, after aging for 48 hours to allow for normal bleaching, are exposed to the ultraviolet rays of an Atlas Weather-O-Meter. A photograph of this commercial test equipment is shown in Fig. 44. Half of each panel is shielded from the ultraviolet rays with aluminum foil so that the original and final color may be compared at the end of the test on the same panel. The test is continued for 200 hours, at the end of which time it is required that the finish must not have dulled or noticeably discolored.

Hardness Test—Tests for hardness of an organic finish are necessary in order to determine either the degree of "cure", or to provide information for use in other tests, as many of the results of the other tests must be qualified in terms of hardness of a particular finish. Various methods of determining hardness have been developed, notably those based on indention such as the Pfund and Knoop indentor methods, the swinging beam or Sward rocker tests or microscratch tests. The Pfund hardness test is one method that finds extensive use and is based upon the indentation produced in the film by a spherical tool under various conditions of load. It has the advantage over other indentation methods that the measurement is made while the tool is in contact

SELECTIVE HEATING: Silver brazing of brake drum and spoke flange to hub without heating the entire work is attained electronically by Harley-Davidson Motor Co., Milwaukee, Wis., by placing the front and rear wheel motorcycle hub assemblies over a copper coil which induces radio frequency current into the work. One complete brazing operation is performed every 40 seconds by the General Electric electronic heater which develops 15 kilowatts of energy. Frequency is 520,000 cycles per second

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TIMKEN SICROME 2 STEEL TUBING
For service up to 1200°F. where better scale resistance is required than can be obtained with 2% Cr. ½% Mo. Steel.

TIMKEN 2¼% CR-1.0% MO STEEL TUBING For service up to 1150°F. Has greater resistance to creep than 2% Cr. ½% Mo. Steel.

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For service up to 1200°F. Has excellent oxidation resistance and good corrosion resistance.

TIMKEN 4-6% CR MO STEEL TUBING
For service up to 1200°F Superior corrosion resistance. Less oxidation resistance than Sicromo 3.

TIMKEN SICROMO 5 S STEEL TUBING
For oxidation resistance to 1500°F. Good creep strength and corrosion resistance to 1300°F.

TIMKEN SICROMO 7 STEEL TUBING
For applications requiring better corrosion resistance than can be obtained with 5% Chromium type steels.

TIMKEN SICROMO 9 M STEEL TUBING This steel possesses the maximum corrosion resistance of any of the steels below the stainless group.

TIMKEN 18-8 STEEL TUBING Shows the best combination of creep strength, oil corrosion resistance and oxidation resistance up to 1500°F.

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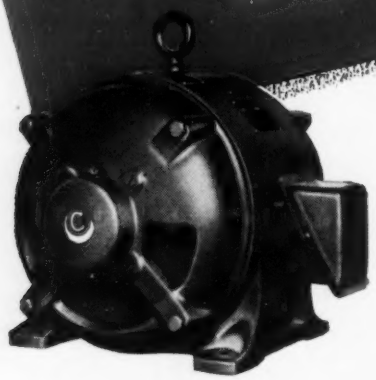

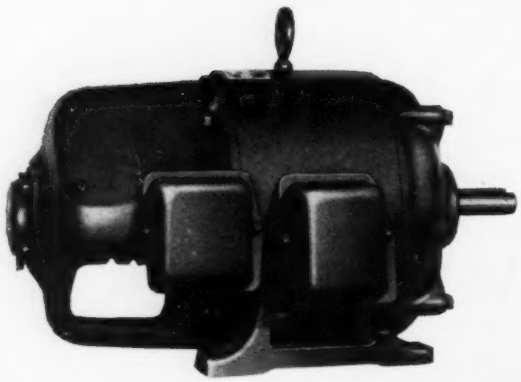

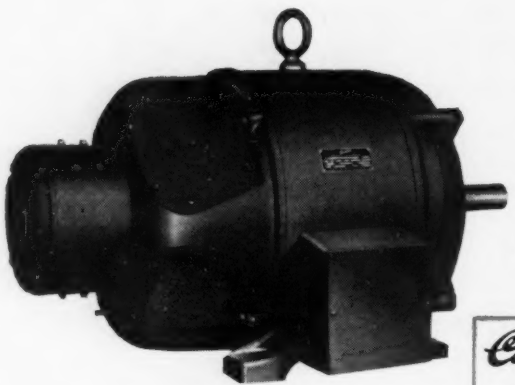

The wide range of types, kinds and sizes of Century motors enables you to specify motors with the right characteristics to meet all popular electric power requirements.

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- **Type SC** motors provide normal starting torque at normal starting current. They are suitable for all general purpose applications—or about 80% of the jobs.
- **Type SCH** motors provide high starting torque with low starting current. These motors handle hard-to-start loads without over-motoring. Typical examples are reciprocating compressors and pumps starting under full load
- **Type SCT** motors combine high starting torque with high slip. They are suitable for equipment having high peak and high impact loads—such as oil well pumps, punch presses.
- **Type SCX** motors in larger sizes develop low starting torque with low starting current for applications that are very easy to start and start infrequently—such as large centrifugal pumps and fans.

In addition to these standard variations of the Type SC motors, Century offers

- **Type SR,** Slip Ring motors with high starting torque, adjustable variable speed control. Typical applications include cranes, hoists, printing presses, bridge raising machinery.
- **Type SY,** Synchronous motors for continuous operation as a power factor load correction, such as for large ventilating fans and electric generators.

Century builds a wide variety of electric motors, single phase, polyphase and direct current, in sizes 1/6 to 400 horsepower. They meet the requirements for all popular electric power applications.

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with the film and is unaffected by its elasticity. However, it has been reported[57] that cold flow of the organic film during measurement may lead to inconsistent results unless time factors are controlled. Shown in Fig. 45 is the Pfund indentor for hardness test used at the Bell Telephone laboratories for measuring hardness of protective organic coatings.

To secure an indication of the hardness of organic finishes that are being tested for use on appliances the Bridgeport test laboratories of General Electric Co. use the Sward hardness rocker, manufactured by the Henry A. Gardner Laboratory Inc., Washington. This test device, shown in Fig. 46, consists of two 4-inch metal rings spaced 1 inch apart with a bubble level at the bottom and two tube-type levels set at different angles in the lower half for indicating the beginning and end of the test. The operation of this instrument is based on the principle that the harder the finish the longer the instrument will rock, once set in motion.

In the test procedure a finished panel, which has been aged for 48 hours, is placed in a level position and the rocker set in motion on its surface. Counting of the oscillations begins from the time the bubble in the left hand tube level fails to move by a mark in the tube, and continues until the bubble in the right hand level fails to move by its mark. The rocker is adjusted to give 50 oscillations on polished plate glass. Multiplying by two gives 100, the value of the plate glass as a reference standard. Based on this standard, the General Electric test requirements are a minimum hardness of 20 for an appliance finish.

Distensibility Tests—One of the most important properties of an organic finish is its distensibility. An important reason for distensibility measurements lies in the fact that they furnish a sensitive criterion for aging.[58] In general, it has been found that those organic coatings which reach a low distensibility most rapidly, also fail the earliest on exposure. Distensibility of attached coatings is determined either by direct extension of a suitable test specimen and observation of the per cent elongation at which rupture, in the form of microscopic cracks, occurs[59] or else by bending over mandrels, either cylindrical, conical or spherical, of known radius and calculating the per cent elongation at first rupture.[60] The Ericksen test is of the spherical mandrel type. A conical mandrel type test developed in the Bell Telephone laboratories[57] has been reported to be quite satisfactory for general testing purposes, and has been specified in government and ASTM specifications. Shown in Fig. 47 are bent specimens from the conical mandrel test as carried out in the Bell Telephone laboratories. However, it has been pointed out that the behavior of the specimens in the conical mandrel test is to some extent determined by the adherence of the film to the base metal. If the film has good adherence, the point of failure in the test will be characterized by many longitudinal cracks, whereas poor adherence gives rise to peeling.

General Electric's appliance finish test uses a conical mandrel to provide an indication of the ability of the coating to stretch without separating from the base metal. The conical mandrel used in this test is shown in Fig. 48. Such an instrument is manufactured by Henry Zuhr, New York; a very complete study of its use has been made.[60] The apparatus consists essentially of a cone 8 inches long having a diameter of 1½-inches at the large end and a diameter of ⅛-inch at the small end. A mechanism is provided to bend the test panel closely around the conical mandrel. The device provides a varied elongation of the film, ranging from 23 per cent around the small radius to 2.2 per cent around the large radius, when the finish has been applied on 22 gage stock, which material is used for test panels at the General Electric laboratory.

Rather than check the per cent of elongation, the General Electric method is to examine the distance of chipping and cracking back from the small diameter of the bent panel. Using a 4-inch wide panel and based on a rating of 10 being perfect, one point is deducted for each 4/10-inch of chipping, and one-half point for each 4/10-inch of cracking. In general, the end use of the finish is a determining factor in the degree of flexibility required of an organic coating. It is reported that a good cabinet enamel should take a bend on the mandrel and show no chipping or cracking. Flexibility must be sacrificed, to a certain extent, in some of the other types of finishes where a special property, such as heat or alkali resistance is chief requirement.

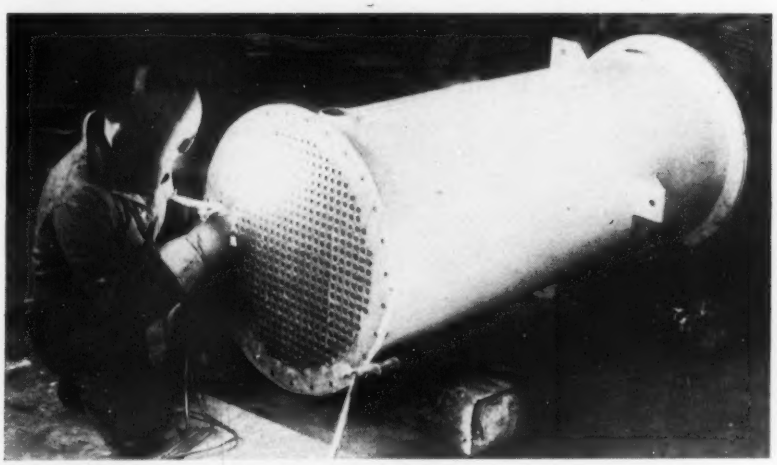
(To be concluded)

OMITTED

In publishing the condensed article "Mechanism of Nozzle Erosion in Open Hearth Ladles," STEEL, p. 88, July 26, 1948, a footnote crediting the American Ceramic Society for the original work was inadvertently dropped. The full paper was presented before a society meeting in Chicago, Apr. 27.

REFERENCES

55. Parker and Michael, *Canadian Chemistry and Process Industries*, p. 82
56. Pringle and Yacko, "Methods of Evaluation of Industrial Finishes".
57. Compton, "Selection of Protective Coatings". Presented before the protective coatings division, spring regional conference of the Chemical Institute of Canada, Montreal
58. Burns and Schuh, *Protective Coatings for Metals*, 340, Reinhold Publishing Corp., New York, (1939)
59. Schuh and Theuerer, *Ind. Eng. Chem.* Anal. Ed. 29, 9 (1937)
60. Arit, ASTM Bulletin, Dec., 1937



SLICK JOB: Stainless steel tubes ¾-inch outside diameter and 1/16-inch wall thickness shown being welded into ¾-inch tube sheet of stainless steel condenser with electrode and weld blanketed with argon gas in process developed by Linde Air Products Co., New York. Absence of spatter reduces postweld cleanup to a minimum. Welds provide good corrosion resistance properties and low degree of porosity minimizing test and repair costs

STRETCH FORMING

of Magnesium Parts

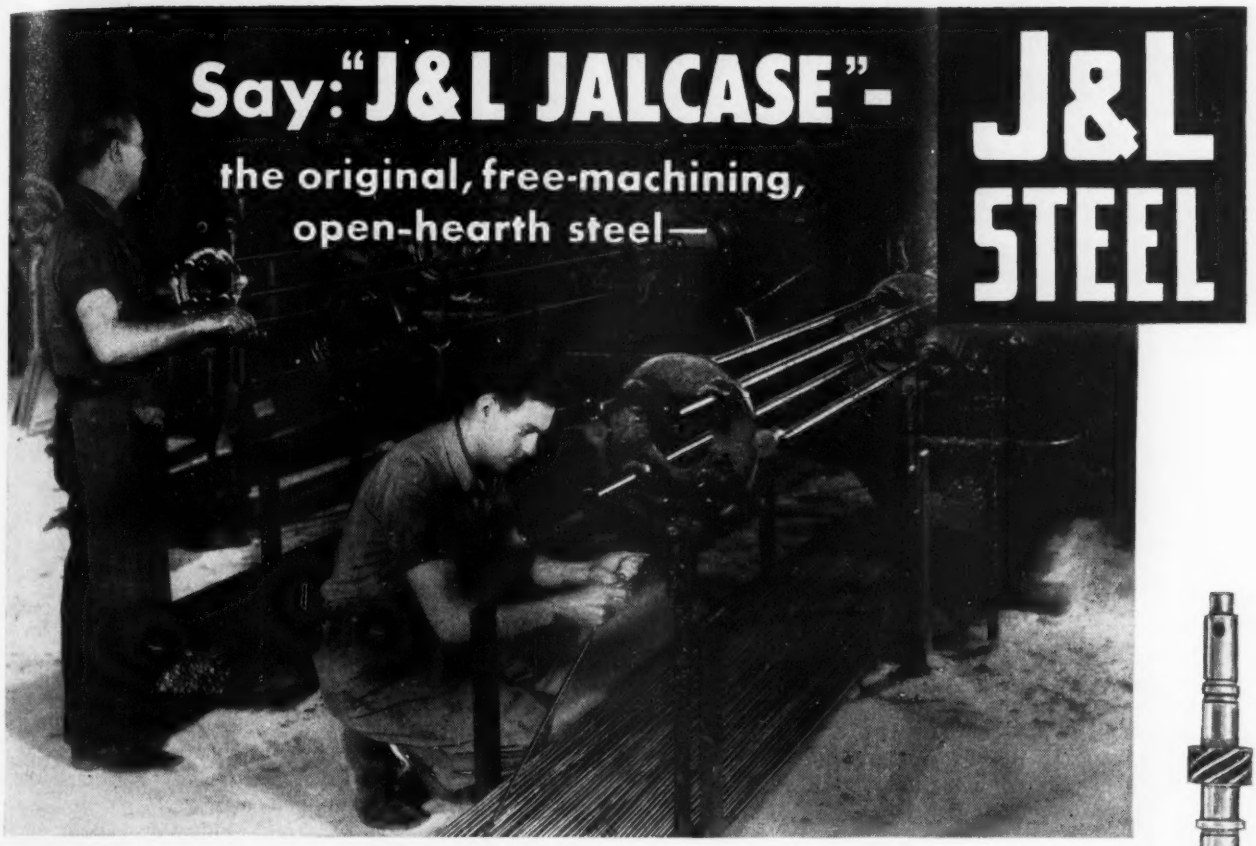
Aided by Spun-Glass "Blanket"

STRETCH forming of magnesium sheets at Glenn L. Martin Co., Baltimore, is aided materially by the use of spun-glass "blankets" to overcome friction between sheet and stretch block. The procedure of forming streamlined structures, such as parts of an airplane skin, by stretching a sheet of metal over die forms has proved to be the most efficient way of manufacturing many complicated shapes.

Originally, in the stretch forming of aluminum, friction set up by pressure between the sheet and the stretch block produced an unsatisfactory finished product that had an irregular wavy surface. A solution often used for this problem was to paint the material to be formed and the stretching block with a heavy coating of grease. Although with this method the desired extension was possible without excessive friction, the liberal use of grease produced a messy and dangerous working condition with slippery floors in the area creating occupational hazards for the workers. Then after the forming operation, removal of the grease often produced hand cuts and resulted in a costly, time-consuming operation.

Substitution of rubber for grease gave favorable results and is still satisfactory for cold forming of aluminum sheets. Magnesium sheets, however, have to be hot formed and the use of rubber under these conditions is impractical because it smokes and smudges under the heat.

After considerable research by manufacturing research personnel, the company decided to use a spun glass blanket 0.0027-inch thick, as shown in the accompanying illustration. Hard smooth surface presented to form block and sheet metal by the glass fibers of the blanket promotes a sliding action between them. It also has a high tensile strength when drawn tight, good heat resistance, and low thermal conductivity. An accompanying passivity of the glass cloth permits it to elongate partially with the sheet metal during stretching operation because of its natural flexibility and looseness of the weave. The foregoing factors have convinced the company of the value of the spun glass blanket in stretching operations, and further experience will produce added data on their life expectancy under present conditions.



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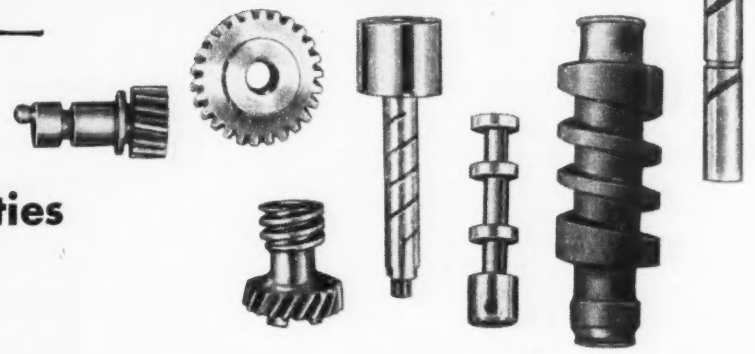

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Looper Guide Pit

. . . designed for safety and ease of maintenance

SATISFACTORY guiding of wide strip steel in long lengths, eliminating tendency of strip to move from side to side, is achieved in modern steel plant rolling mills by providing controlled, free hanging vertical loops of wide strip material immediately ahead of critical stages in processing lines. Such loops can be shallow or deep depending on operation directly ahead and immediately following the loop.

If a continuous heat treating furnace follows the loop, then an accumulation of uncoiled strip in a deep loop is necessary to maintain continuous operation of the furnace while changing from one spent coil to another. Dual purpose of all deep loops is: (1) Fundamentally to secure accurate guiding of strip into furnace, and (2) to act as a reservoir for strip during welding operation in order to maintain continuous operation through heating furnace.

First steel strip producing organization to install looper-guide pits was Carnegie-Illinois Steel Corp., Pittsburgh. A typical looper-guide pit of recent construction is at the company's Irvin Works, and it functions to make possible dependable control over guidance of strip through a heat treating furnace by means of suitable pinch rolls and guides producing a more uniform product with superior flatness.

Design Features — This pit incorporates many design features in addition to its large size that make it what is believed to be one of the largest overall lopper-guide pits in the steel strip industry. Pinch rolls and auxiliary equipment are of heavy design, ample in size and capacity to accommodate wide strip up to 11 gage (nearly ⅛-inch) in thickness.

Bottom of pit is 70 feet below mill floor level. Its top opening is 17 feet long and 8 feet wide. Walls are constructed of reinforced concrete, 21 inches thick for bottom 20 feet, and 16 inches thick for remainder. Concrete was poured monolithically, as far as possible.

Electrical Basement — All of the electrical control equipment required for operation of processing line is beneath mill floor level in a room known as the electrical basement.

Walls of the looper-guide pit pass downward through this room. In one corner of the pit, an access door from the electrical basement has been provided which permits workmen to enter the pit for maintenance purposes. A guarded steel ladder permits maintenance men to reach the bottom of the pit, where a pump and sump are located to eliminate water. From this ladder, with the simple precaution of using a safety belt it is also possible for a workman to reach the recesses in the wall which house the electric lights that illuminate the pit.

A series of horizontal steel channels extend across the pit, 3 feet from the entering side wall at about 5-½ foot vertical intervals. The ladder was installed between these channels and the pit wall, so that anyone using the ladder is protected from accidental contact with the steel strip suspended in the pit.

Electric Eyes — Also located at the bottom of the pit are four electric eyes which control the position of the bottom of the loop when the pit is in operation. Maintenance of the receiving elements of these devices is simplified by the fact that they are located in the ladder side of the pit and can be worked upon in complete safety. Light sources, on the opposite wall at the bottom of the pit, seldom require attention but can be serviced by crossing the floor of the pit beneath the suspended loop which is stopped for the required period

Openings in opposite pit walls in the electrical basement 63 feet above the pit bottom permitted installation of another electric eye unit that limits the upward travel of the end of the loop. Unit can be serviced from the floor of the electrical basement without entering the pit. This upper limiting control is supplemented by a mechanical tripping device above it that will operate in the remote eventuality that the loop of strip should ever rise to the excessive height where tripper is located.

Framework of heavy wooden members, securely fastened to the walls on entering and exit sides of the pit, extends from top to bottom and protects strip from coming in contact with the concrete pit walls. Top of the pit is securely protected by a heavy railing of welded pipe, with walkways that make it possible to cross over the pit in complete safety.

Materials Handling Film, Manual Released by G-E

How to reduce costs through the use of more efficient materials handling equipment and methods is the theme of General Electric's new program, "Materials Handling in Receiving, Warehousing and Shipping". This latest addition to the company's More Power to America program consists of a 16-mm, all color sound motion picture and a 96-page application manual. Produced with the co-operation of materials handling trade associations, equipment builders and consultants in the field, the program will be used as a selling tool for modern materials handling equipment and techniques.

The 20-minute film shows in considerable detail the special capabilities of equipment: High maneuverability of many smaller trucks in confined areas, versatility of battery-operated fork trucks, ability of magnet cranes to handle unwieldy objects, the role played by diesel-electric locomotives in spotting and switching cars in large plants.

Knowledge of the capabilities and requirements of cranes, conveyors and industrial trucks, especially when planning new buildings, is one of the five important factors in making materials handling surveys listed in the manual. Other points outlined are careful route analysis, considerations of physical plant conditions, handling methods and costs analysis.

—o—

Steam generator which delivers superheated steam at 500-pounds pressure for the operation of steam driven well drilling rigs, for heating and for power loads of all kinds has been developed by Vapor Heating Corp., Chicago. It is a self contained unit, requiring only connection to a water supply and a natural gas line or capped well.

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Gun-Fired Brushing Method

Used To Clean Condenser Tubes

MOST effective method yet found for cleaning the tubes of steam condensers is a gun fired brushing technique developed co-operatively by West Penn Power Co., Pittsburgh, and Osborn Mfg. Co., Cleveland and which has been tested under varying conditions for a period of over two years.

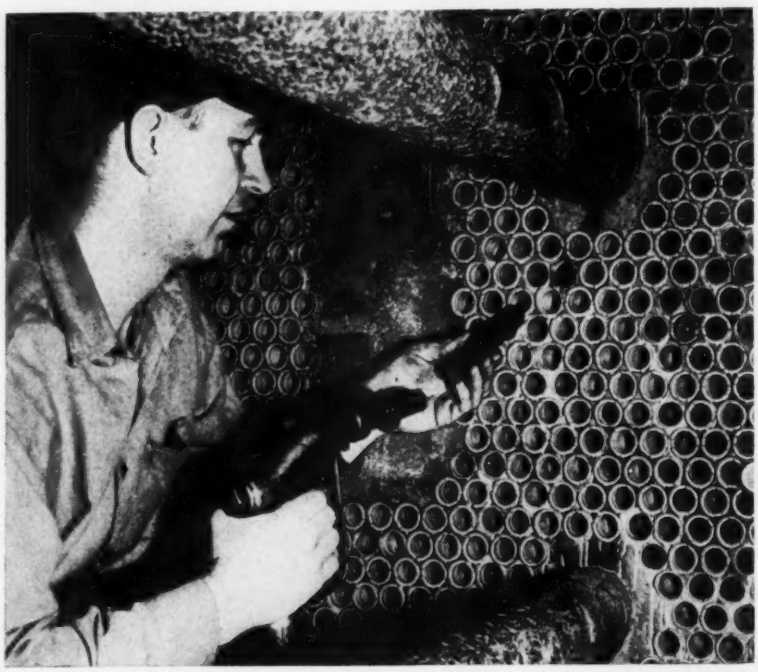
It not only decreases down or outage time required for this necessary cleaning operation, but also results in prolonged tube life by eliminating the scratching and roughening of the interior tube surfaces.

Method of cleaning the steam condensers involves the use of nylon brushes approximately 4 inches in length and ranging from ¾ to 1 inch in diameter, depending upon the inside diameter of the tubes. A cone-shaped steel washer, slightly smaller than the inside diameter of the tube, is welded to the wire stem at the trailing or pushing end of the brush. As shown in accompanying illustration, brush is placed in the end of one of the 18 to 24-foot copper alloy tubes, and is shot through the tube by water delivered by a nozzle-like gun at 200 pounds per square inch pressure.

Brushing method not only rids the tube of mud and slime but it also brushes off and washes out all the algae so that a thorough cleaning job is done. No algae spores are left to help collect further deposits.

Records indicate that since these special brushes have been used, condenser cleaning periods have been much farther apart. This results in considerable savings because of the fewer equipment outages, and also because of the longer periods before sufficient new deposits accumulate to seriously affect the heat transfer of the condensers.

Cleaning an ordinary-sized condenser, containing from 6000 to 9000 tubes, is generally completed in two 8-hour shifts. In view of the limited space in which cleaning men must work, it is usually not practical to use more than two men for the operation, one to plug brushes into tubes and the other to follow up with water gun. A third man sometimes attends the two cleaners and returns brushes for continued shooting.



Industry Offered Alloy Which Resists Corrosion

An alloy, known as Elgiloy, said to be particularly adaptable to heavy manufacturing and metal industries and developed under the direction of the research department of Elgin National Watch Co., Elgin, Ill., and Battelle Memorial Institute, Columbus, O., has been offered to all industries which may be able to utilize it. Originally developed for watch mainsprings, the metal is said to possess tremendous strength and toughness in addition to corrosion resistant qualities.

At the present time the alloy is manufactured in strips up to 2½ inches wide or as round wire by Athenia Steel Co., Clifton, N. J., and Wilbur B. Driver Co., Newark, N. J. Requests for the material to use experimentally can be made to Elgin's research department or to the two processing companies.

Electroplaters' Society Makes Awards at Meeting

Honors were received by several authors for papers presented at the annual convention of American Electroplaters' Society, Jenkintown, Pa., held in Atlantic City, N. J., June 29 to July 1.

Dr. Abner Brenner and Seymour Senderoff received the Herminia Dorothea Proctor award of $100 for their paper, "The Helical Contractometer, a New Instrument for the Measurement of Stress in Electrodeposits". R. H. Cahan and C. E. McKinnon of E. I. duPont deNemours & Co. were given the Founders Gold Medal for their paper, "Diaphragm Tanks To Eliminate Roughness in Copper Plating."

Awards were also given to authors of articles appearing in the society journal *Plating* during 1947-48. C. F. Nixon, Ternstedt Division, General Motors Corp., and Dr. R. C. Olsen, Pacific Lutheran College, won the society's award of $50 for their article "Notes on Nickel and Chromium Plating", and E. J. Roehl, Thomas Steel Co., was presented the society's gold medal for his article, "Mechanical Properties of Nickel Deposits".

—o—

Simplified practice recommendation R-3-44, metal lath and metal plastering accessories, has been reaffirmed without change, according to an announcement by National Bureau of Standards, Washington. It covers expanded and sheet lath and plastering accessories such as cold rolled channels, corner beads, base beads, concealed picture mold, metal casings, tie wire and hanger wire.

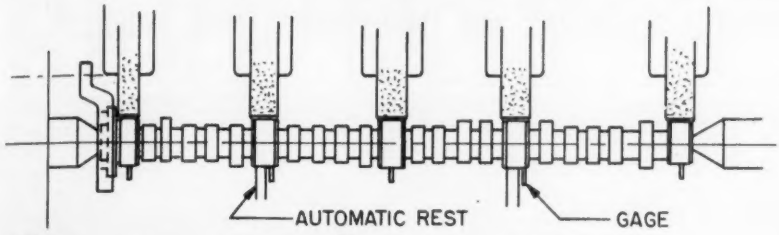


Fig. 2 (left)—Camshaft line bearings are being ground five at a time on production grinder. Rests supporting shaft come into position automatically

Multiple Grinding

. . . of automotive shafts jumps production rate

GRINDING operations such as those required on camshaft line bearings for Cadillac and International Harvester Co., and on transmission shafts for Ford Motor Co., now may be done with a new production grinder. Designated as 10 x 30 inch type CH-IW, it is manufactured by Landis Tool Co., Waynesboro, Pa. Production on International Harvester line bearings is 90 shafts per hour for removing 0.025 to 0.030-inch from diameter in green grinding and the same rate is maintained for removing 0.010 from diameter in finish grinding.

Machines of this type carry a number of grinding wheels on a spindle between bearing supports so that several bearings on the same shaft may be ground simultaneously. Diameters being ground need not be straight since provision has been made to profile dress the wheels, thus permitting tapers and other odd shapes to be produced.

Wheel dressing is by means of a hydraulically traversed table type diamond dresser. Accurate form dressing is accomplished by having the diamond bar follow fully adjustable profile bars mounted on front of machine.

Wheel spindle is mounted in sealed, pressure lubricated bearings made by Landis Tool Co. A safety switch prevents the wheel drive motor from starting until lubrication pressure is built up to a specified point, and conversely, the wheels will stop rotating if pressure in this system ever fails.

Hydraulically operated wheel feeds consist of a rapid feed for advancing wheel to cutting position and a slow feed for actual grinding. A built in device prevents the slow feed from starting until the rapid speed is against its front stop. Hydraulic cushions are used for the front and return strokes of the rapid feed on the wheelbase. Carboloy tipped shoes on the hydraulically operated backrests automatically move into position at the end of rapid feed stroke.

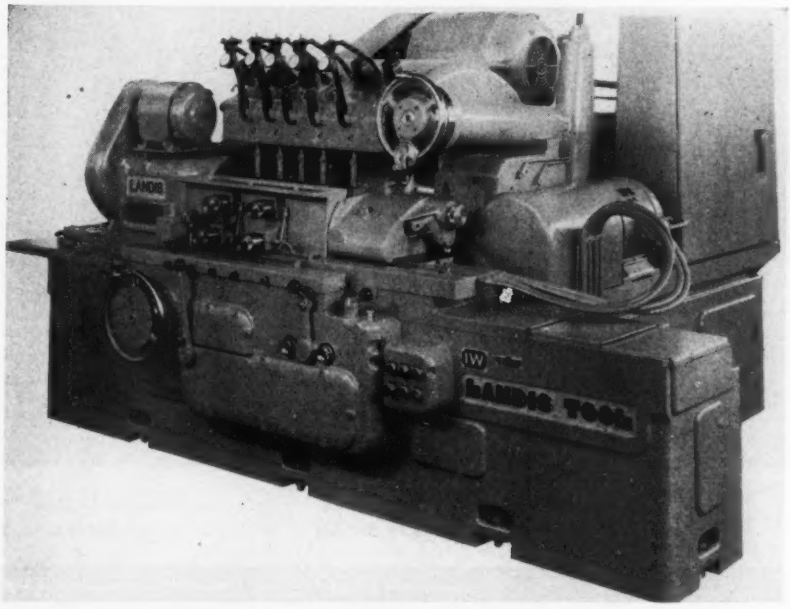


Fig. 1 (right)—Closeup of multiple wheel plain hydraulic grinder

Improved Welding Rods Give Thinner Metal Flow

Chemical and metallurgical improvement in the manufacture of flux coated welding rods has been effected by Eutectic Welding Alloys Corp., New York, giving a greater and thinner flow of the joining alloy. Rapid flow insures capillary action, smoother welds, protects the weld area from overheating and minimizes the possibilities of distortion and stress to the parent metal.

Improved capillary flow of flux-coated welding rods eliminates delays due to manual fluxing operations and reduces amount of heat ordinarily applied to the area. Reduced heat leads to welds that are warp free, scale free and surfaces are adequately fluxed to insure surface alloying that improves the physical properties of the joint welded.

—o—

Loose loading of freightcars contributes a major share to high toll of shipping damage to packaged freight according to an announcement by Shipping Container Institute, New York. Full length or width of the car should be taken up by boxes or bracing, and containers must be stowed snugly enough to prevent possibility of development of slack in load during transit.

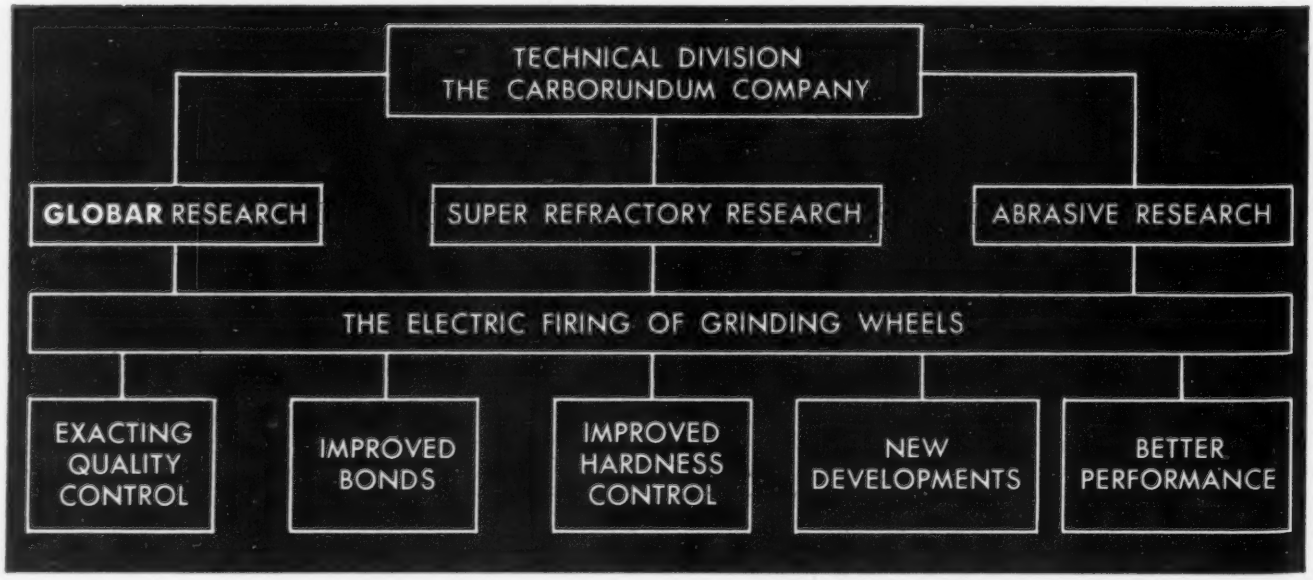
Aluminum Nails Added to Building Products Line

Aluminum nails in 6 types and sixteen different sizes are now being manufactured for the building industry by Reynolds Metals Co., Louisville. Plaster board, shingle and felt paper nails are being produced in addition to common and roofing nails.

Some advantages claimed for the new fasteners are retention of attractive appearance even after years of service, no danger of rusting and ability to withstand attack from the elements in roofing applications. All of the nails made by the company are etched to retain their holding power.

THE TEAM WHICH HAS DEVELOPED ELECTRIC FIRING, AND THE "SCORE" IT HAS PRODUCED

Standing: E. Hediger, GLOBAR Division — D. G. Foot, Abrasive Division — I. M. Logan, Refractories Division
Seated: B. A. Bovee, GLOBAR Division — H. C. Martin, Technical Director — P. H. Walker, Abrasive Division



HERE IS NEWS you should have

ANNOUNCING
the electric firing of vitrified grinding wheels

As a user of abrasives, you are the direct beneficiary of a sensational improvement in the production of grinding wheels. As the leading name in abrasives it is natural that the first news of this process should come from us.

Out of a long period of experimentation, the electric firing of grinding wheels has been brought to the level of large-scale production. The benefits to you are five-fold.

1 EXACTING QUALITY. By electric firing, many factors are eliminated which heretofore jeopardized strict production requirements. Our electric kilns assure a firing curve that would satisfy the most demanding furnace foreman and contribute to a steady production of perfect wheels.

2 IMPROVED BONDS. Electric furnace procedure provides considerably more latitude in the development and selection of bonds for vitrified abrasive wheels.

3 BETTER HARDNESS CONTROL. Improvements in product quality, which are permanent standards of CARBORUNDUM engineering, have been combined with more efficient production techniques. By means of this new firing method, duplication of wheel quality is controlled to an exact degree.

4 NEW DEVELOPMENTS. An advancement of this kind will naturally encourage and stimulate our technicians. We confidentially expect to announce startling improvements in abrasive products soon.

5 BETTER PERFORMANCE. Abrasives—as good as they are...are being improved continuously. And our technical parade will continue to advance, producing better abrasives for American Industry, which in turn is producing better products and services for the world.

Only the combined resources of The Carborundum Company could effect the achievement. Electric firing of such accuracy calls for GLOBAR electric heating elements. A kiln which operates at such exacting temperatures demands CARBOFRAX and MULLFRAX super refractories.

This is a technical development of large proportions. It could be brought to fulfillment only by a Technical Division with the capacity and facilities for turning up new knowledge in the fields of chemical, electrical and abrasive engineering. The Carborundum Company, Niagara Falls, New York.

CARBORUNDUM

TRADE MARK

BONDED ABRASIVES • COATED ABRASIVES • HEATING ELEMENTS • SUPER REFRACTORIES • GRAIN

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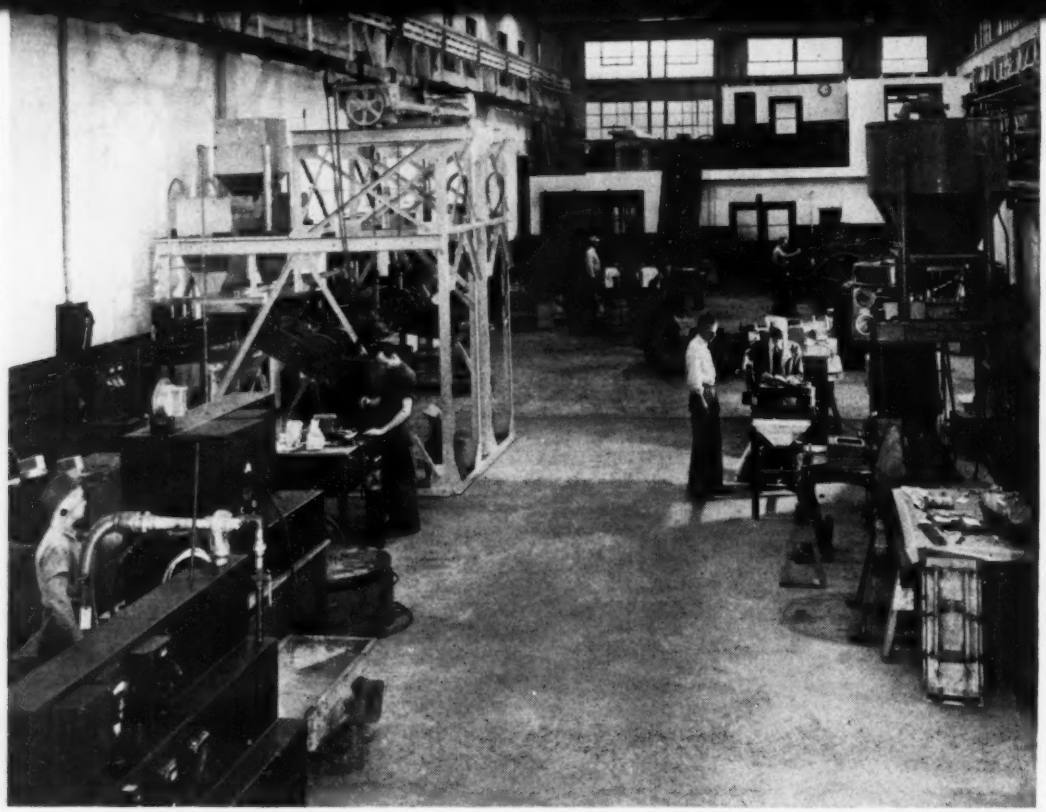


Fig. 1—Jeffrey research center, showing one end of main shop

By L. E. NEWELL
Superintendent of Research Manufacturing and Testing
and
C. S. THOMAS
Metallurgist
Jeffrey Mfg. Co.
Columbus, O.

Practical Research Program

. . . uses down-to-earth planning and close co-operation between metallurgist, designer and shop man to control production and quality

BY practical use of its new research center, Jeffrey Mfg. Co. is enjoying some solid benefits in the form of reduced costs without sacrificing the quality of its products. Basically, the research program has three broad aims: First, by simplifying metallurgical specifications on materials purchased by eliminating requirements which are not truly significant. Second, by investigating metallurgical specifications applied to parts now being manufactured. Finally, facilities of the research center are used to determine mechanical and metallurgical properties of materials considered for use in new parts or for a change in materials for parts already being manufactured.

There is no question that a well-planned and executed program of investigation of material specifications, both as applied to material purchased and its subsequent processing and end use, will mean better quality, increased production rates and lower costs. It can be shown that such a program will even contribute to the conservation of natural resources. Use of a highly alloyed steel, for instance, in an application where a low alloy or carbon steel can be made to work, results in a saving of alloy elements for use in applications where they are essential to successful performance.

Net saving in alloy content can mean greatly increased steel production per ton of alloy elements used. Our country is not rich enough in such elements as nickel and chromium, for instance, to permit haphazard use of them or materials containing them. We believe it to be the duty of American metallurgists to seek for and test low alloy steels for use in applications now using highly alloyed steels.

One illustration will demonstrate the possibilities of saving money by judicious choice of steels. Use of A8640 and A8620 triple alloy steels, low in total alloy content, instead of A3140 and A3120 dual alloy steels but higher in total alloy content, produced five-figure savings per year with no sacrifice in quality or mechanical properties in the parts produced. Test results showed conclusively that no mechanical property suffered in the substitution made here. Actual service performance was compared. The conclusion was positive.

Test work may often be undertaken for other reasons than improved design and materials. Difficulties may develop in processing a part. Machinability complaints are received or parts may begin to break in forming. Here the almost routine steps of trouble-shooting investigation begin. First a hardness test is made, then a micro for study of microstructure. These two tests alone often show the reason for poor machinability or formability.

A steel may be of the correct hardness but still machine poorly. Microstructure will often show the reason. A fine dense lamellar pearlite structure means poor turning but good broaching. A spheroidized structure means good turning but poor broaching. One of our production problems is maintaining smooth surfaces in punched and shaved holes in 0.40 carbon alloy steels. For this operation, a structure free from spheroidization is best and is so specified to the steel mill supplier.

One interesting problem recently solved was the choice of a steel which would become a large tire shrunk on a wheel, the tire to drive by friction a large bucket conveyor chain in a temperature of 900° F. To be wear-resistant, the steel had to maintain

hardness at 900° F. It could not be too hard at room temperature else it might break under the shrink stresses or the shock loads received before the 900° F operating temperature was reached. The tire was of such a size that it could not be economically ground after heat treating. Consequently it had to be low in distortion when hardened.

A hot die steel was indicated, a steel not usually considered for actual load-carrying engineering uses. Published data were examined and three hot die steels were chosen for testing. Hot hardness tests were made to determine the hardness maintained at 900° F. Impact tests, both notch bar and no notch, were made. Distortion tests from hardening were made. Tensile tests were made to determine yield strength and elongation. A low carbon chrome molybdenum air hardening hot die steel showed the best all around properties. One set of tires was made for field trial. When the field test proved satisfactory the tires were put into production.

On any test program designed to benefit production through lower cost and without sacrifice of quality, several factors must be jointly considered. Each has bearing on the other. First is the design of the part, its physical shape. Here the metallurgist must work with the design engineer. A metallurgical test investigation may be expected to show that a cheaper material can be used if certain design changes can be made. The designer must be ready to co-operate or the tests will be made for nothing. In our metallurgical test work, in making a choice of materials based on metallurgical test results, design and processing problems as well as service requirements and conditions are kept in mind constantly.

The metallurgist, if responsible for test programs, must be acquainted with design problems, processing methods and service functions of the parts involved. He must know his shop machines, their capacities and limitations. Metallurgy is just part of the process of test work. The investigator should have, or cultivate, a commercial attitude of mind. The commercial aspects may dictate the final choice of materials used. Tests for the sake of testing the collection of data not needed, however interesting, is a luxury not to be afforded.

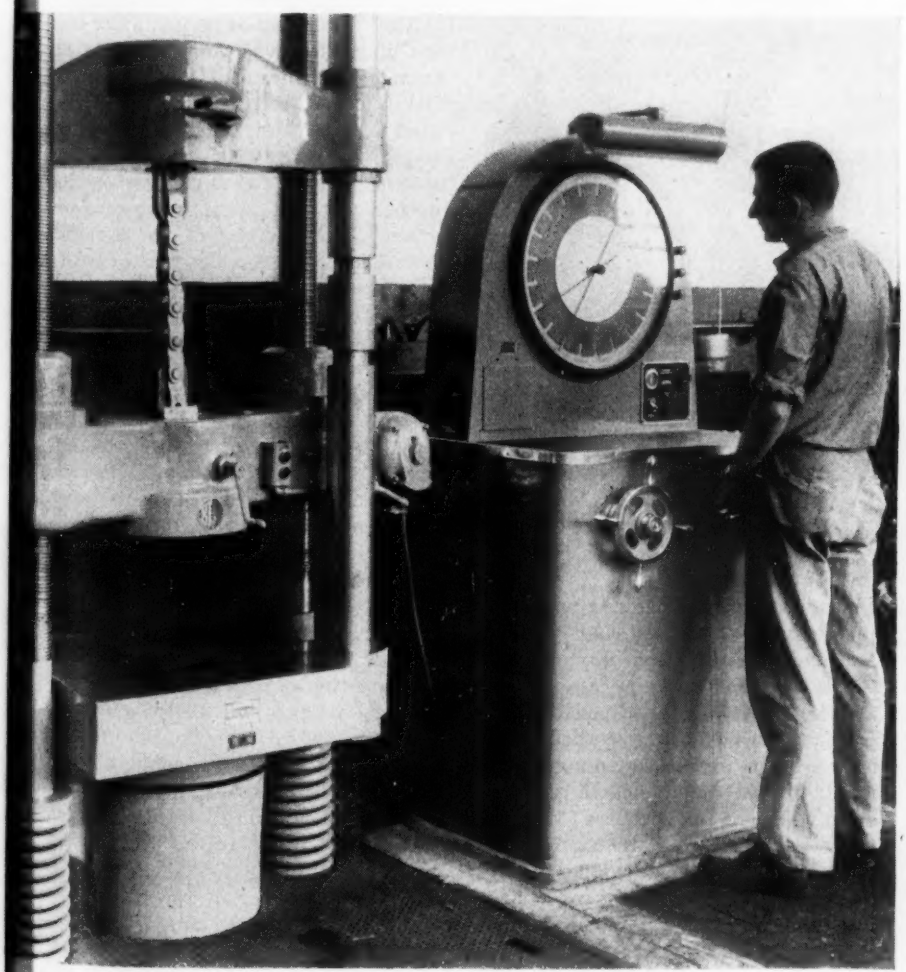


Fig. 2—Tensile test machine with chain specimen being tested

Test machines and procedures necessary to metallurgical investigation supplement one another. There is no one or two machines which can be used to the exclusion of all others in any comprehensive test program. Each one is a tool of the investigator. Each one adds some significant fact to the investigation and all facts are to be considered before judgment can be given or test opinions made. All test machines and procedures have limitations which must be understood and allowed for in the interpretation of test results.

For this reason, trained personnel is equally important, really more important, than the finest of test machines. Tests made on necessarily small specimens may be entirely in error when applied without correction or modification to the design of a larger part. Hardenability of the steel in the larger size must be considered and allowed for in the design. Correct interpretation of test results, achieved only by trained personnel, is most important. It has often been said that one test is worth a thousand opinions but that is true only if the test is correctly interpreted.

To complete a workable combination of test and production facilities, particularly in the metallurgy of the problem, it is necessary to have reliable and efficient production heat treating equipment. Otherwise the lessons learned from test results can be made barren by the use of unreliable, outworn equipment. Both test and production equipment should be suitable to production requirements.

Selector Chart Prepared For Bronze Electrodes

Recommended arc welding electrodes for joining like or dissimilar metals are charted in a bulletin recently published by Ampco Metals Inc., Milwaukee. Chart lists 31 alloys and shows which of 5 bronze electrodes is best suited for the welding application together with proper preheat that is necessary for each joining application.

Metals listed cover copper, copper-base and iron-base alloys. Electrode is selected by locating the two metals to be joined, one in a horizontal and one in a vertical listing and taking the electrode listed at the intersection of lines projected from these points.

Latest Metallurgical Developments

. . . discussed at 1948 Annual Meeting of British Iron & Steel Institute

Professor Robert F. Mehl of Carnegie Institute of Technology, Pittsburgh delivered the third annual Hatfield Memorial Lecture on the subject of "Decomposition of Austenite by Nucleation and Growth Processes"

ANNUAL meeting of the British Iron and Steel Institute was held in London on May 5 and 6, 1948. Dr. C. H. Desch, retiring president, was in the chair at the opening session, and extended the greetings of the institute to visitors from the following countries: Belgium, France, Norway, Spain, Sweden, Switzerland and the United States making special mention of Prof. Robert F. Mehl of the Carnegie Institute of Technology, Pittsburgh, who in the evening of May 5, delivered the third Hatfield Memorial Lecture on: "The Decomposition of Austenite by Nucleation and Growth Processes".

The Bessemer Gold Medal for 1948 was awarded to W. J. Dawson in recognition of his contributions to the development of steel casting and to the production of alloy and heat resistant steel. The Sir Robert Hatfield Medal for 1948 was awarded to A. Preece, lecturer at the Leeds University in recognition of his researches on the overheating and burning of steel. The Williams prize for 1947 was awarded to R. Fowler of Richard, Thomas and Baldwins, Ltd. for his paper concerning "Blowing Out a Blast Furnace". The Andrew Carnegie Travelling Scholarship was awarded to A. W. Postlewaite for the study of powder metallurgy in the United States and the Mond Nickel Scholarship in metallurgy was awarded to D. R. G. Davies for the study of the application of statistical methods to plant metallurgical and management problems with particular reference to the steel industry in the United States and England and to L. H. Walker for the study for the methods of application of group industrial research particularly in relation to the fabrication of light metals in the United States.

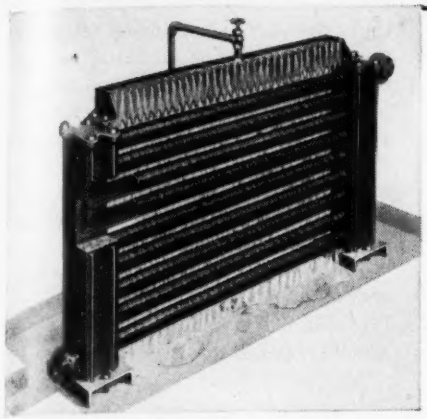
Following these announcements Dr. Desch inducted the new president, Sir Andrew MaCance, D. Sc., into the chair. Dr. MaCance is deputy chairman and joint managing director of Culvilles Limited, Glasgow. Dr. MaCance then delivered his presidential address on the subject of "The Development of the Open Hearth Furnace" in which he recorded a history of the invention and development of the open hearth furnace since Siemens and Pierre Martin's early attempt in the 1860's. He also reviewed the progress made in furnace dimensions, methods of charging, charging time and production rates, heat input and chemical reactions, ingot size in relation to output and heat recovery. In conclusion he stated "Heat is not the only waste product in our industry which will repay study and attention, and I will conclude by saying that it is only a determination to find some use for all the products which have hitherto been regarded as waste as well as by a correct understanding of all the factors concerned in intensive production that we can hope to maintain the economic success of the steel industry in these unbalanced and difficult times".

PROF. ROBERT F. MEHL

The first group of papers presented for discussion was on the subject of open hearth furnaces. D. C. Muir, of the Consett Iron Co., Ltd., contributed a paper on "Construction and Repair of Open Hearth Furnaces". In this paper the author gives an account of the furnace repair program at the works of the Consett Iron Co., Ltd. over a period of seven years and of a system of balanced repairs which enabled nine out of ten furnaces to be in production at any one time.

A paper on "The Design of Open Hearth Gas Ports" was contributed by M. P. Newby, of the British Iron and Steel Research Association. The author describes experiments that were carried out on a model of the gas port of a producer gas fired open hearth furnace with the object of determining the efficiency of a port considered as an arrangement for converting pressure energy into kinetic energy of gas motion; the resistance of the port to the outgoing products of combustion was also measured. The experiments showed that the designs tested have fairly high efficiency and that changes in design can bring only a limited improvement.

The third paper of the group was entitled "Installation and Use of Instruments on Open Hearth Melting



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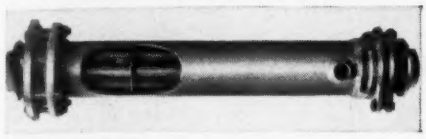
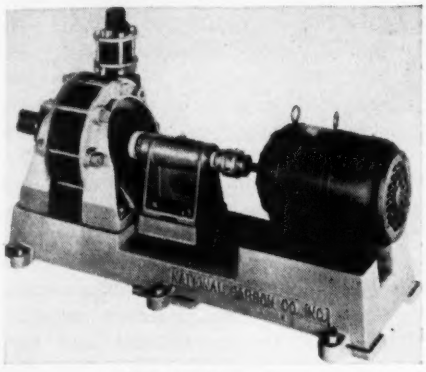
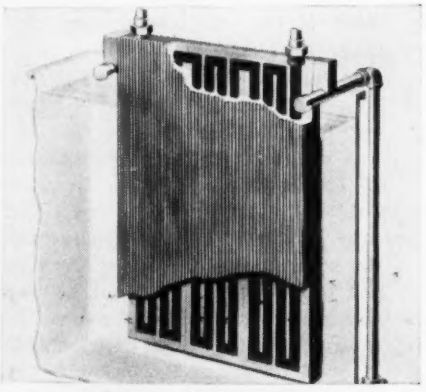


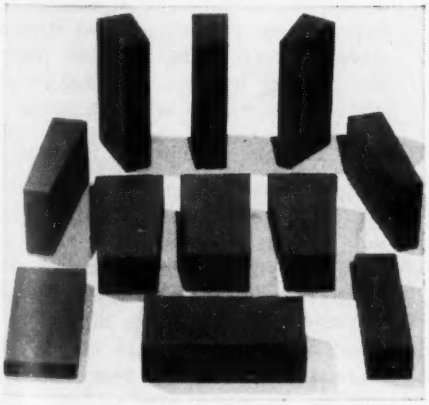
"Karbate" Series 70 Heat Exchanger



"Karbate" Pump



"Karbate" Plate Heater



Carbon Brick for Tank Lining

How to lick corrosion if you pickle or plate metal . . .

USE NATIONAL CARBON PRODUCTS

FOR HEATING, cooling, pumping, and conveying the corrosive solutions used in pickling and plating metal, there's no better equipment than that made of "Karbate" brand Impervious Graphite. This material is chemically inert, immune to thermal shock, easy to machine and install, light in weight yet strong; and has a very high heat-transfer rate.

Operating experience has proved that "Karbate" equipment stands up in sulphuric, hydrochloric, and nitric-hydrofluoric pickling solutions . . . Parkerizing and Bonderizing baths . . . nickel, copper, tin, and zinc plating solutions . . . electro-polishing and Alumilite and Alzak processes.

"National" carbon brick is now extensively used for lining tanks that handle corrosive solutions – particularly nitric-hydrofluoric.

For more details on metal-cleaning systems of standard "Karbate" brand Impervious Graphite units and "National" carbon brick, write to National Carbon Company, Inc., Dept. S.

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Furnaces", by R. C. Baker, of John Baker & Bessemer, Ltd. The author describes the installation and development of recording and control instruments for routine use in a small open hearth plant. Features of the system are the recording of the furnace roof temperature and the gas and air flows on one chart, also an experimental automatic crown temperature control.

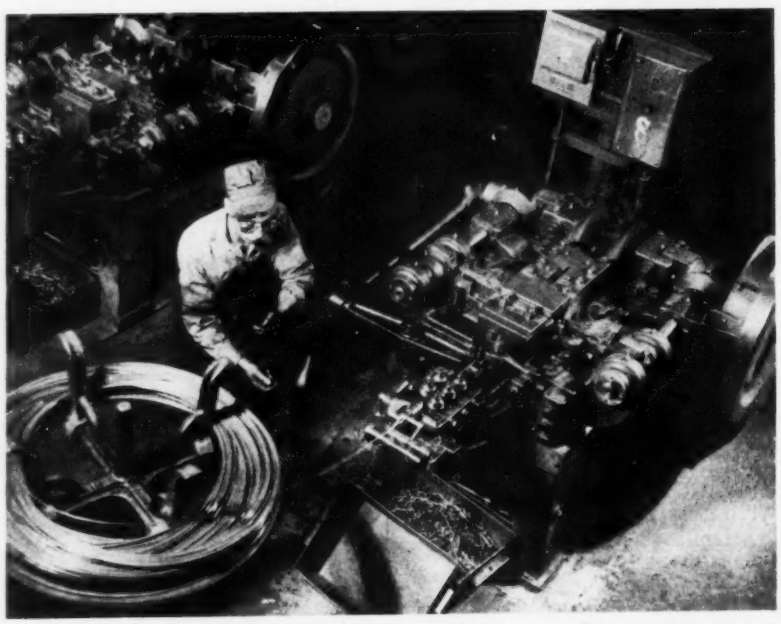
Two papers were devoted to the structure of cast irons. The first, by H. Morrogh and W. J. Williams, of the British Cast Iron Research Association, was on "The Production of Nodular Graphite Structures in Cast Iron". The study has been continued of the production of nodular structures in nickel-iron-carbon alloys by the addition of cerium to the molten metal; nodular structures are obtained in hyper eutectic alloys even with very low nickel contents. When the alloys contain appreciable amounts of sulphur, no nodular structure is obtained. Attempts to produce nodular structures by adding cerium to low sulphur hypo eutectic cast irons were only partially successful, but when hyper eutectic irons were treated structures consisting of hyper eutectic spherulites and quasi-flake graphite were obtained. With increasing amounts of cerium in such irons the mechanical properties show a progressive improvement.

The second paper of this group was by D. Marles, of the British Cast Iron Research Association, on "The Carbides in Iron-Carbon-Silicon Alloys and Cast Irons". A metallographic study was made of the carbides occurring in cast irons and iron-carbon-silicon alloys with silicon contents up to 7 per cent and carbon contents of 1.7-3.6 per cent. It was found that with silicon contents in excess of about 2.5 per cent a carbide phase appears which does not respond to heat tinting in the same way as normal cementite. With increase of silicon up to 7 per cent this phase increases in amount, while the normal cementite phase decreases until at 7 per cent the carbide phase consists entirely of the constituent not responsive to heat tinting. It is suggested that this carbide phase is a silico-carbide and that it has a lower stability at elevated temperatures than normal cementite.

A paper was contributed by J. Glen, of the research department of Colville, Ltd., Motherwell, on "Abnormal Creep in Carbon Steels". This describes short time creep tests at a stress of 8 tons per square inch at a temperature of 450° C, carried out on a series of low carbon steels contaning 0.4 to 1.5 per cent manganese, 0.01 to 0.15 silicon and 0 to 0.11 molybdenum, and with varying amounts of aluminum up to 3 pounds per ton. It was shown that manganese, silicon and molybdenum within the limits examined, reduce the creep rate and that the abnormal creep resulting from aluminum additions is reduced considerably by these elements. In production casts of basic open hearth steel it was shown that, with proper control, aluminum may be used as a deoxidizer, provided that the steel remains coarse grained as measured by the McQuaid-Ehn test.

Another paper on creep was "The Creep Properties of Molybdenum, Chromium-Molybdenum and Molybdenum-Vanadium Steels", also by J. Glen. Creep tests at different temperatures and stresses were carried out on 0.5 per cent molybdenum, 0.8 per cent chromium/0.5 per cent molybdenum, and 0.5 per cent molybdenum/0.25 per cent vanadium steels, and the effect of carbon, silicon, manganese, and aluminum were determined. The effects of various heat treatments were also examined. Rupture tests up to 58,000 hours duration were carried out and the mode of failure discussed. By an extensive series of long time creep tests the stress temperature relationships for 0.1 per cent and 0.2 per cent deformation on 100,000 hours were estimated for the molybdenum/vanadium steel and suitable short time tests for checking the qualities of such steels were discussed. The results show that the molybdenum/vanadium steel in the normalized and tempered condition has creep and rupture properties much superior to those of the molybdenum and chromium/molybdenum steels.

Inclusions were dealt with in three papers. The first, by Dr. J. H. Whiteley, of the Consett Iron Co., Ltd., was entitled "A Micro Examination of Eight Steels for the Inclusions Sub Committee". The results indicate a direct relationship between the number of inclusions in the steels and their combined sulphur and oxygen contents. The second paper, "The Study of Segregations and Inclusions in Steel by Micro Radiography" was by Dr. W. Betteridge, of the Mond Nickel Co., Ltd. and R. S. Sharpe, of the Aero Engine Division of Bristol Aeroplane Co., Ltd. In this paper the authors describe a technique of radio micrography which includes a simple mechanical method for the preparation of the necessary thin samples. The examination showed that the overheating of steels does not produce segregation of the metallic alloying elements towards or away from the grain boundaries of the austenitic structure. Sharply defined segregates rich in manganese were shown to be a very common feature in many steels. The third paper of this group was "Some Ther-



MACHINE GUN SPEED: Cyclic rate of fire of a .30 caliber machine gun is approximately the same as for these machines making 400 nails per minute in the Aliquippa Works of Jones & Laughlin Steel Corp. Shown is part of a battery of these new machines, said to operate with a 25 per cent increase in productive capacity and a 15 per cent increase in efficiency over older machines

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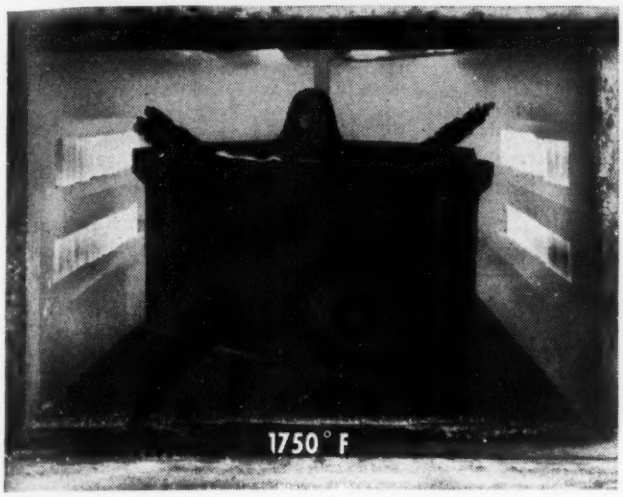
Lowers Your Tooling Costs!



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• In *Vega* you now have an air-hardening tool steel that can be heat treated from a temperature 200°F *lower* than the 5% chromium air-hardening steels! As a result, expensive pack hardening to avoid excessive scaling can often be eliminated. And because the hardening temperature of *Vega* is only 1550°F, you need no special high temperature furnaces.

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modynamical Aspects of the Formation of Inclusions in Mild Steel Weld Metal", by Dr. E. C. Rollason, research department of Murex Welding Processes, Ltd., and E. Bishop, research department of William Jessop & Sons, Ltd. A method of thermodynamical analysis is described, which showed that, in spite of the short time involved in arc welding, equilibrium of the molten metal is largely attained at an estimated temperature of 1710° C, and the process of inclusion formation in weld metal has been shown to obey the general principles of thermodynamics. Evidence from analysis of inclusions shows that the oxygen content of the weld metal is determined by the FeO content of the slag; consequently, a method has been evolved whereby the types and amounts of inclusions to be found in many weld metals can be determined by using the FeO content of the slag and the total manganese and silicon contents of the weld metal.

The last three papers were concerned with ingots and ingot molds. The first paper, by W. L. Kerlie, Stewarts & Lloyds, Ltd. was "A Comparison of Moulds of Standard Composition". The author reports on examinations made of a number of ingot molds representing two different compositions, under controlled conditions. Direct correlations between silicon content and mold life and phosphorous content and mold life were found, when all the molds other than the abnormal ones were considered. The most important conclusion obtained was that with a mold composition close to the one recommended by the Ingot Mold Sub Committee an average mold life of 130 casts is to be expected, compared with an average of 100 for the standard composition.

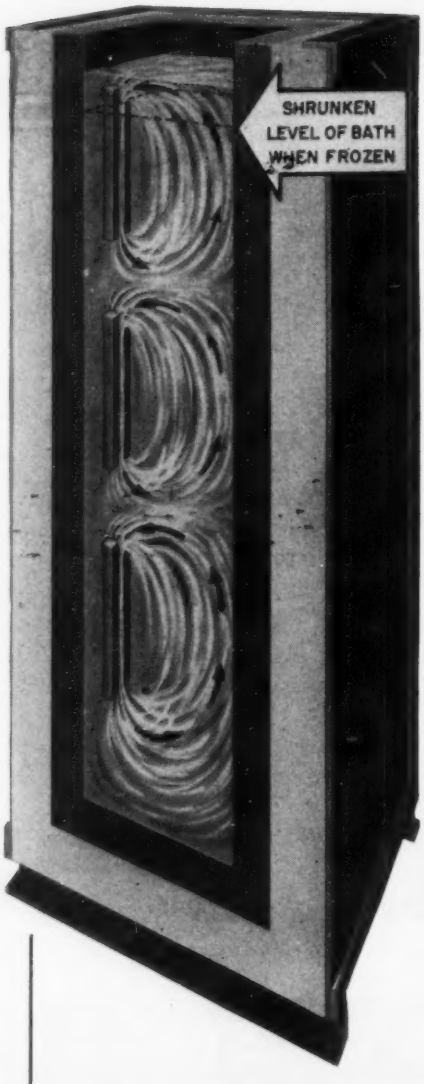
"Mould Weight/Ingot Weight Ratio and Its Relation to Mould Consumption" was the title of a contribution by N. H. Bacon, of Steel, Peech and Tozer, branch of the United Steel Companies of Sheffield. The author gives the result of his study of three Ingot Mould Sub Committee questionnaires and of a report by the British Intelligence Objectives sub committee on "German Ingot Moulds for the Casting of Steel Ingots". The data examined were for many types and sizes of molds used in the various works in Great Britain and Germany, and from them the importance of the mold weight/ingot weight ratio in its relation to mold consumption was established. Attention is drawn to the very large variations in mold weight/ingot weight ratio found within the United Kingdom and Germany, viz., in the United Kingdom 0.78 to 1.76 and in Germany 0.61 to 1.82, and possible reasons for such variations are suggested.

P. Walker, Cargo Fleet Iron Co., Ltd., contributed the paper on "Formation of 'Double Skin' or 'Curtaining' on Top Poured Mild Steel Ingots". This paper describes the work carried out to determine the cause of the surface defect present on top poured mild steel ingots and known as 'double skin' or 'curtaining'. The results indicate that two factors are of significance, (a) trapping of deoxidation slag near the ingot surface during solidification and (b) splash moving forward from the mold wall and allowing liquid steel to flow behind it. The former factor gives "double skin" effect not visible on the surface, and the latter a visible "double skin" or "curtaining".

—o—

Refractory cupola blocks of a new design which permits setting a wide range of lining diameters with whole blocks of a single shape are now being produced by Harbison-Walker Refractories Co., Pittsburgh. The new shape features alternate convex and concave ends which form a highly flexible but tight fitted curve end joint that maintains a complete contact over entire end surfaces regardless of diameter of lining.

LONG WORK HEAT TREATED
In Vertical Position



CONTROL over distortion, simplified fixtures and work holding devices and reduced floor space are some of the advantages of a newly designed salt bath furnace made by Ajax Electric Co., Philadelphia. This furnace permits work regardless of length to be hung vertically and can be used for heat treating in temperature range of 300 to 2400° F.

In the vertical furnace electrodes are inserted through side walls and are completely immersed in the bath. Shown in the accompanying illustration is a cross section view of a submerged electrode furnace having three pairs of closely spaced vertical electrodes, cascaded for ease of restarting. Arrows show electrodynamic circulation which assures uniform bath temperature, regardless of depth of bath or number of pairs of electrodes used.

There is no danger of creating sealed-in pressure at the bottom of bath while top is still frozen because melting of a solidified bath is from top to bottom. In restarting the top pair of electrodes melts salt within its zone and presents molten salt to electrodes directly beneath and so on down to bottom of bath. Since heating current is confined to narrow gap between the closely spaced electrodes, the full depth of furnace may be used without danger of current entering work to cause overheated zones or premature pot failure due to hot spots.

Firthaloy Dies

Will draw any shape

EASILY, FAST, ECONOMICALLY

- Recognized high quality of Firthaloy carbide grades assures greater wear resistance—longer life.
- Correct designing and a complete line of grades provide "tailor-made" dies to fit your exacting requirements.
- High standard of workmanship insures accurately made and better finished products.

FIRTHALOY SHAPE DIES

Made with either solid or sectional nibs for drawing standard and special shapes of ferrous and non-ferrous wire, rods and tubes.

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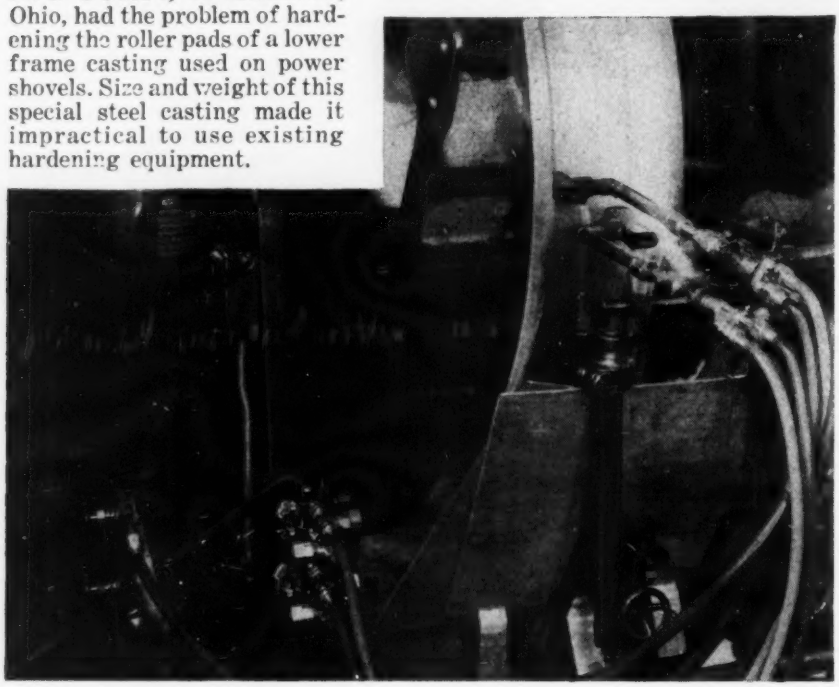
In Canada—Chapat Engineering & Sales, Ltd.

3400 pound steel casting flame hardened in 25 minutes

COLUMBIA MACHINERY AND ENGINEERING CORP., of Hamilton, Ohio, had the problem of hardening the roller pads of a lower frame casting used on power shovels. Size and weight of this special steel casting made it impractical to use existing hardening equipment.



D.P. Carey, Airco Technical Sales Representative, suggested building a fixture for positioning and rotating the castings and for mounting the torches and accessory equipment. Using this special equipment, which rotates the 3400 pound casting at a speed of 7 inches per minute, the hardening cycle is accurately controlled and requires only 25 minutes. Two torches simultaneously flame harden both the upper and lower faces of the roller rings to a depth of 3/32 inches.

Thus, the hardening operation easily keeps pace with the rest of the shovel manufacturing and has more than proved entirely satisfactory.

TECHNICAL SALES SERVICE — ANOTHER AIRCO PLUS-VALUE FOR CUSTOMERS

Technical Sales Service—though not a packaged commodity—is as readily available to all industry as any Airco process or product. If you have a metal working problem, ask to have a Technical Sales Division man call. Address Dept. 3-8246, Air Reduction, 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Co., Houston 1, Texas. On West Coast: Air Reduction Pacific Company, San Francisco 4, California.

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Packaging Competition Feature of Handling Show

Entries of protective package designs developed by some of the country's leading packaging engineers in several categories will feature the competition at Industrial Packaging and Materials Handling Exposition in Chicago, October 5-7. There will be separate classes for wooden boxes, corrugated and fiber containers, wire bound boxes and a general classification for designs that do not fall into these categories. There will also be a special award for packages specially designed for export shipment.

Exposition is produced by Industrial Packaging Engineers Association, Chicago, and will also include a Packaging and Materials Handling short course consisting of eleven sessions opening one day ahead of the exposition proper. The course will be conducted jointly by the association and members of the University of Illinois Faculty of the College of Engineering and Commerce School.

Forming and Drawing Die Alloy Developed

Production of a new aluminum bronze alloy for use in forming and drawing dies was announced recently by Ampco Metal Inc., Milwaukee. Designated as Ampco Grade 24, in one case the new die alloy produced 77,000 pieces of stainless steel before redressing.

It is suitable for a wide range of service and is cast to customers' patterns either by sand or centrifugal methods to provide die blanks that are reasonably close to size, thus eliminating much preliminary machining. Typical die uses include: Stainless steel beer barrels, automotive hub caps, headlights and other accessories, sinks, dairy containers and switchboxes.

—o—

Standards and equipment for testing and certifying small fixed standards of capacitance ranging in value from 100 down to 0.001 micromicrofarads have been established according to a recent announcement from National Bureau of Standards, Washington. This work has involved the development of a series of primary reference standards and the construction of several fixed secondary standards and variable capacitors. For values below 0.1 micromicrofarad, a new type of primary standard capacitor has been designed utilizing a principle which makes practical the construction of units having a capacitance as small as desired.

For Money-Saving Maintenance

GENUINE *Jeffrey* REPLACEMENT PARTS

Eliminate costly shutdowns with genuine Jeffrey Replacement Parts. They fit exactly because they are made to the same specifications as the original part. They can be installed in a minimum of time. They'll last longer, too, because Jeffrey engineers and metallurgists often add improvements to the already high standards of original parts.

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Complete Line of Material Handling, Processing and Mining Equipment

MINE WIRING
Maintenance Plan

. . . prevents accidents and production delays

SOUND maintenance plan for underground wiring will aid greatly in avoiding accidents due to electrical shock and delays in the production schedule caused by equipment failure, stated Carlyle R. Burton, Oliver Iron Mining Co., Pittsburgh, at the annual conference of Lake Superior Mines Safety Council in Duluth, on June 17-18. This program may be sold by explaining general plan to men who work underground and making sure they understand why certain rules must be enforced, he continued.

Periodic check should be made of following items: Transformer temperatures, transformer and substation insulators, switches, cables, cable end bells and connections. All power distribution breakers should be inspected once a week to see that operating temperatures are not excessive, and once a year blades and fingers should be checked and the oil tested.

Direct current motor generator set or rotary converter should be cleaned, and tested with a megohm meter once a year. Air compressor, auxiliary and hoist motors and hoist control should be put on same maintenance schedule as the under ground locomotive power supply. Hoist and slack cable indicator should be inspected once a month and reset when cage and skip are tested.

Disconnecting switches and sectional overload protection should be provided to facilitate location of trouble and prevent large portions of the mine being without power due to trouble in one small section. These switches will also permit power to be removed from sections of the mine where no men are working.

Only maintenance required for main power and signal cables that are usually in main hoisting shaft will be to check periodically the condition of supporting clamps, corrosion of cables, and to megger cables once a year to check insulation. Underground pump installation should be made in as clean and dry a place as possible, using same or greater electrical clearances as are used for surface installations. Pump motors and their controls that are not used often should be inspected weekly and meggered every three months.

Electrical connections to scraper and tugger motors should receive special attention because they are contacted daily by the miners. A fused switch or magnetic starter with overload protection should be provided near the tugger work place. Providing a disconnect switch at the tugger will enable operator to remove power in an emergency or whenever he leaves his machine.

Usually the only maintenance required for lighting system is to replace burned out lamps, repair damaged light cords, check loading of lighting units and resuspend wiring after retimbering. Complete blasting

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SHEETS • PLATES
STRIP • STAINLESS STEEL
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circuit must be checked every week.

Trolley disconnecting switches should be installed at loading chutes so that trolley power may be removed at station directly in front of chute. Haulage track must be bonded across rail joints, between rails and between rails and air or water lines. Mr. Burton suggested preparation of a checkoff list for each haulage locomotive, listing various points to be inspected or lubricated with a space for recording date this was accomplished.

All switches should be marked with tags, indicating equipment controlled and size fuse required, he said in conclusion. Where cables of different voltages are used in the same mine, junction boxes, controllers and motors should be plainly marked.

—o—

Test to predict resistance to tool wear of any specimen of hard metal was developed at the Osram laboratory in Germany and is contained in a report on tungsten carbide research published by Office of Technical Services, Department of Commerce, Washington. Description of a technique of coating steel with a thin hard metal skin, descriptions of processes of making boron carbide and titanium boride are included.

NEW LITERATURE

HOLDING LOW TEMPERATURES WITH BETTER INSULATION
By International Mineral Wool Institute, 441 Lexington avenue, New York 17. A two-color, 24-page manual covering how to select insulation and what to look out for; data on forms, properties and application methods, principles and significance of vapor-proofing for various types of wall, floor and ceiling construction. Contains 15 photographs, 11 diagrams, seven charts and tables and typical case histories.

NICKEL AND HIGH NICKEL ALLOYS
By International Nickel Co. Inc., 67 Wall street, New York 5. Handbook and guide on nickel, Monel, Inconel and associated alloys as well as such other alloys as the Hastelloys and Illium. Gives properties, heat and corrosion resistance, also modern fabrication and finishing practices.

POWDER METALS
By Murex Limited, Rainham, Essex, England. Four-page bulletin discusses powders for the manufacture of hard metal.

HOW TO RUN A LATHE
By South Bend Lathe Works, South Bend 2, Ind. Book contains latest information on operation and care of metalworking lathes; has 128 pages and contains over 365 illustrations. Copies are available with paper covers for 25 cents, with leatherette covers for $1.

UNBRAKO DOWEL PINS
By Standard Pressed Steel Co., Jenkintown, Pa. Four page bulletin describing new line of high-grade alloy steel dowel pins and giving pertinent data.

CHEMICAL SAFETY DATA SHEET SD-17 ON ANILINE
By Manufacturing Chemists' Association, 608 Woodward Bldg., Washington 5, D. C. Manual sets for important physical and chemical properties of aniline, usual shipping containers and methods for unloading and emptying, container storage and hauling, recommended personal protective equipment, etc. Available from association at 20 cents per copy.

BATTERIES FOR INDUSTRIAL USE
By Gould Storage Battery Corp., Depew, New York. Catalog No. 10 explains what takes place inside a Kathanode cell and emphasizes the Kathanode Glassklad construction of batteries for industrial truck and tractor service.

MIDGET MILL GROUP
By Severance Tool Industries Inc., Saginaw, Mich. A 12-page, illustrated pamphlet, Bulletin No. 16-M gives full listing of Midget Mills and also company's ground carbide hand files and ground carbide die machine files. Contains data on various patterns of cut tooth characteristics and pitches of teeth and gives information on company's regrinding service.

TOPS IN TAPPING
By Charles L. Jarvis Co., Middletown, Conn. Twelve-page catalog contains complete specifications of all standard taps and dies in the Jarvis-Dowding line and provides a data sheet for ordering these or for specifying requirements for specially designed and engineered taps and dies for unusual or difficult needs.

TOPFLIGHT TAPE AIDS ASSEMBLY OF CLEANER

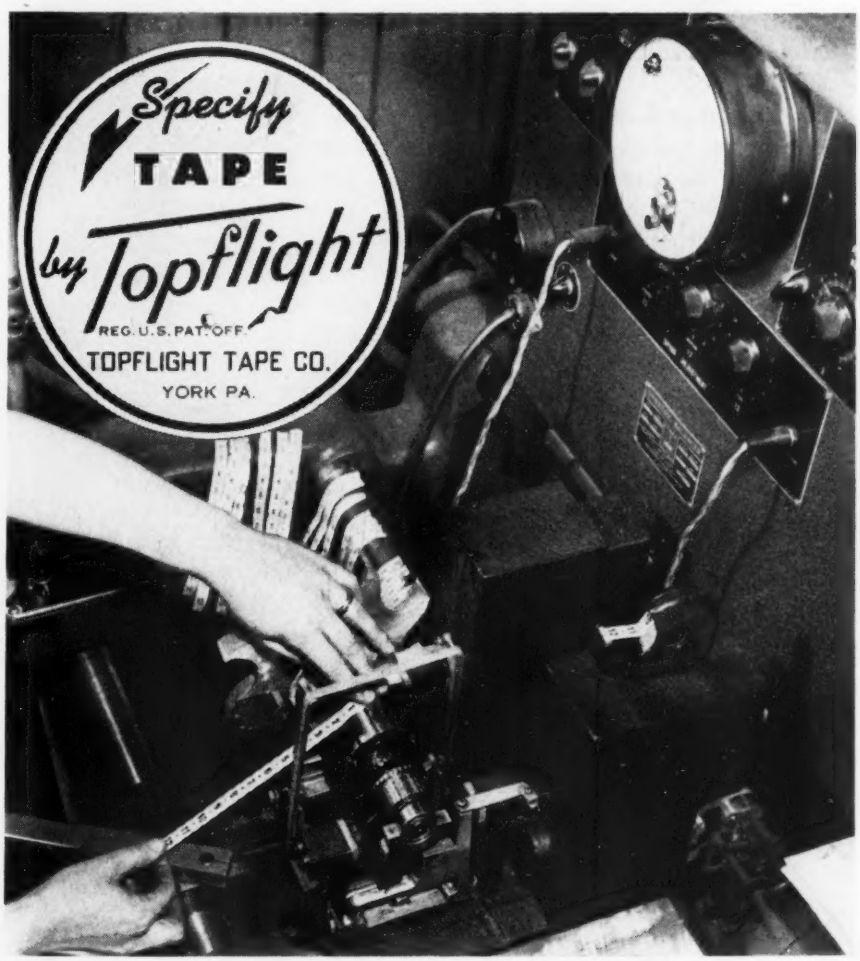
Super Service System marks armature poles

Portable power cleaners for large office and industrial buildings have been pioneered and perfected by the National Super Service Company, Inc., of Toledo, Ohio. Used for hotels, art galleries, libraries and other vast area cleaning jobs, they are well known for performance. Super Service, has found printed cellophane Topflight Tape a most practical parts marking and identification device.

Pole identification

In assembly of Super Service cleaners, the Gisholt Dynetric Balancing Machine is used to assure perfect balance of armature and fan assemblies. As illustrated, Topflight numerical tape is applied to mark the poles of armatures, as the polarity is established and balanced.

Topflight Tape is pressure-sensitive and printed to order.



TOPFLIGHT TAPE COMPANY

ERWIN HUBER, *President*

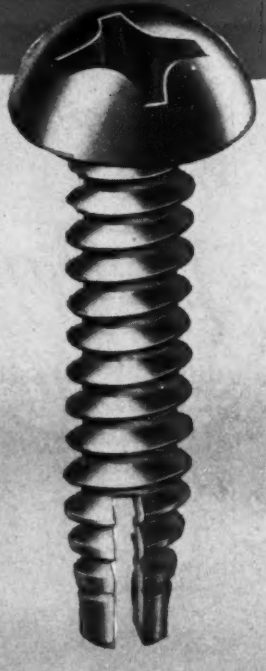
YORK PENNA.

ELIMINATE TAPPING COSTS

Here's how it's done. The slot, corresponding to flutes of a tap, provides two balanced cutting edges and a chip reservoir. *In photo note chips cut and pushed ahead.*

HOLTITE "TAP" SCREWS

U.S. Patent No. 2,292,195 Other patents pending.



Do not confuse this remarkable new screw with the ordinary self-tapping screws that forcibly displace the material by a cold forging action.

Fundamentally a narrow fluted two-flute tap, this new "TAP" screw actually removes the material when *cutting* its own perfect mating threads to effect tighter, stronger fastenings that resist vibration.

Fine or curled metal chips, and tough, gummy non-metallic cuttings free themselves readily in the open slot reservoir to prevent binding. The two balanced cutting edges of slot cut threads much deeper than their own diameter.

• Eliminate tapping operations by using HOLTITE "TAP" screws in metal, castings, alloy, rubber, plastics, etc. You'll get stronger fastenings at less cost!

CONTINENTAL SCREW CO. New Bedford, Mass., U.S.A.

Copper Tube Standards Submitted to Industry

Proposed commercial standards for automotive and refrigeration service copper tube have been submitted to the respective producers, distributors and users for acceptance or comment according to an announcement by National Bureau of Standards, Washington. These standards which were developed at the request of, and in co-operation with Copper & Brass Research Association provide minimum requirements for eight standard sizes of seamless copper tube, ranging from ⅛ to ¾-inch in diameter. Standards cover chemical and physical requirements, condition, dimensions, weight, tolerances, packaging and a method of identification.

Giant Hydraulic Press Made for Deep Drawing

One of the largest double action, all hydraulic, deep sheet metal drawing presses ever built is the 78-ton press with an overall height of 34½ feet that was recently completed by Hydraulic Press Mfg. Co., Mount Gilead, O. It will be used to deep draw long cylindrical tanks for the storing of gas and liquids. A typical example of work scheduled for this press is a part 36 inches in diameter and 28 inches deep, which will be drawn in a single stroke from a blank 72 inches in diameter.

Large 1500-ton press ram is equipped with a 600-ton internal high speed booster ram which more than doubles initial drawing speeds for work which does not require drawing pressures above 600-tons. Two electric motors of 200 horsepower each are used to drive the radial pumps which generate hydraulic pressure for operating the press.

Check List Prepared for Occasional Solvent Users

Since accident records suggest that troubles with solvents arise more frequently where these chemicals are used only occasionally or in comparatively small quantities, Safety Research Institute Inc., New York, has prepared a check list for small or occasional solvent users. It is emphasized that even a single instance of careless or improper handling of a solvent may under certain circumstances result in a fire, sickness or both.

Users are advised to follow instructions of the manufacturer or packager—containers should be kept closed, adequate ventilation should be provided, workers' hands should

be protected, workers should be trained to be good housekeepers, solvent operations should be well supervised and men who work with solvents should be in good health.

University Offers Quality Control Course

An intensive 10 day course in quality control by statistical methods was announced recently by State University of Iowa, Iowa City. Course will be offered at the university October 5-15 inclusive.

These methods of quality control have shown excellent results in: Aiding in conversion of production, improving quality of purchased materials, economies in use of labor and materials, improving quality of final product, decreasing rejections, decreasing inspection costs and improving producer-consumer relations. Course is designed for persons in supervisory positions where the knowledge gained can be applied immediately.

Stainless Alloy Plated Without Electricity

Uniform nickel plating without use of electric current may be secured with a process developed by Lustraloy Sales Corp., New York. A bright high quality finish that is tarnish and corrosion proof results from the new plating process. It has been used successfully on products where sharp corners must be plated without excess metal buildup or beading, and where it is necessary to surface inner tubing walls with an inside diameter of 0.20-inch.

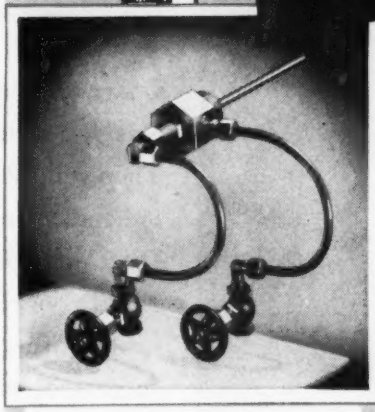
Through use of heat treatment, which is at relatively low temperature and harmless to the finish of most base metals, the new material may be hardened to as high as vickers pyramid number 900 with unusual ductility. Hardness at this level equals that of most hard chromium plate, and wear resistance has been found equally comparable.

C.W. Hanna, Senior Author

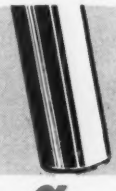
C. W. Hanna, Kennametal Inc., Latrobe, Pa., should have been credited with the senior authorship of the article dealing with rapid spectrographic analysis of cemented carbide compositions, STEEL, p. 86, June 28, 1948. John C. Redmond of the same company inadvertently was given sole credit for the data presented. Fig. 1 of the same article indicated cadmium as an element in cemented carbide compositions. This should have been cobalt.

NOW

AVERT PLANT SHUTDOWNS!
HAVE 2 FUELS AVAILABLE!
OIL STANDBY EQUIPMENT
—inserted in 'Surface' High and Low Pressure Types Gas Burners feature quick change-over—
GAS-TO-OIL and OIL-TO-GAS.



EASY TO INSTALL — change-over gas-to-oil and oil-to-gas is a matter of seconds for most installations.



PREVENTS LOST TIME

● Proved in 159 furnace installations —1100 burners, during winter of 1947 by 61 enthusiastic users. Provides low cost insurance against lost production and shipping schedule upsets. Builds employee relations and creates customer goodwill.

ACT QUICKLY!—the demand for this new Oil Standby Equipment is rapidly absorbing the available production facilities for installation this fall.

SURFACE COMBUSTION CORPORATION
TOLEDO 1, OHIO

'Surface' INDUSTRIAL BURNERS AND FURNACES

ATTACH THIS COUPON TO YOUR LETTERHEAD AND MAIL

☐ RUSH 8-page bulletin giving specifications and engineering details.
☐ Glad to have your engineer determine our requirements.

NAME.....

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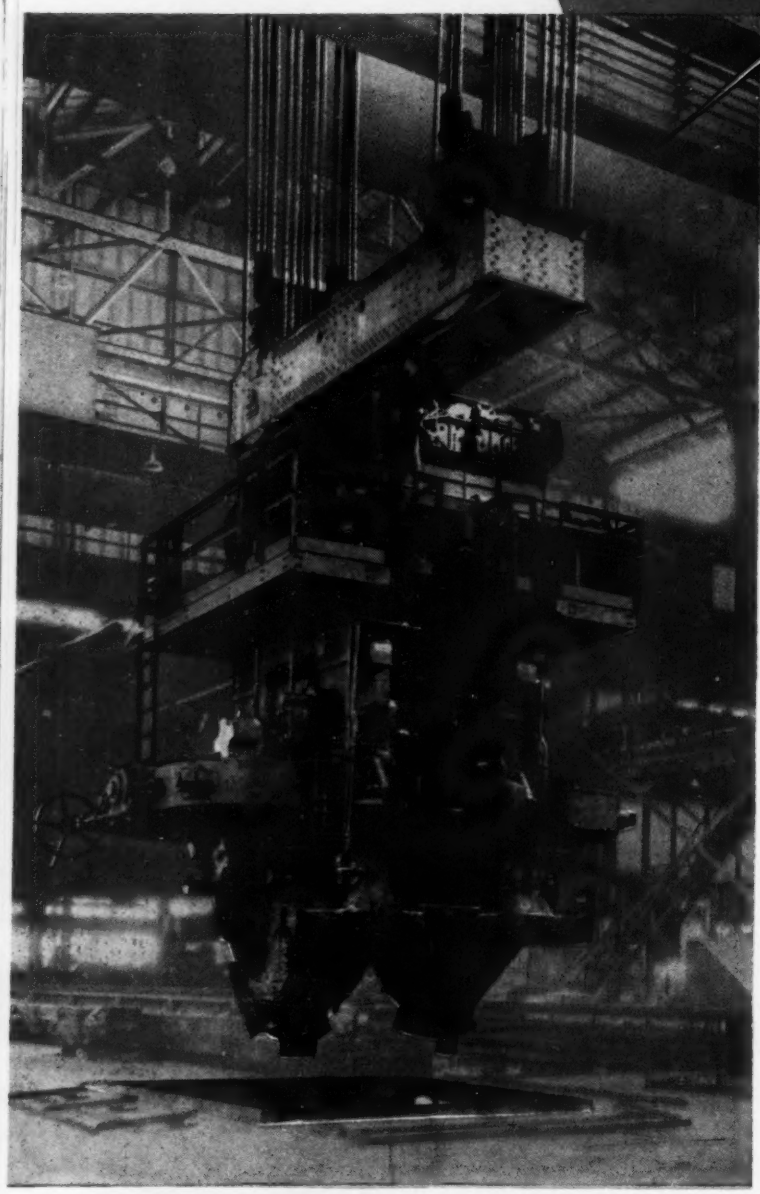
RETURN THE COUPON ↑ Today!

Alliance

LEADER IN THE FIELD OF *Crane Design* FOR HALF A CENTURY



Shown here is a 300-ton, 4 Girder, Double Trolley ALLIANCE Crane. It has a 300-ton Main Hoist, a 40-ton, and a 5-ton Auxiliary Hoist.

• Are you handling heavy loads . . . moving slabs, in gots, hot metals, raw materials, or finished products Then your plant needs sturdy, *efficient* Alliance crane to handle these tough jobs safely, quickly, and easily Developed by the world's largest builders of th world's largest cranes, Alliance equipment is bui for long, rugged service . . . designed to give you un surpassed, economical lifting power wherever it needed in your plant.

Alliance specialists have studied materials han dling problems for 50-odd years . . . have designe and developed thousands of cranes to handle all type of loads in many different industries. Let Alliance engineers show you how to maintain smooth-flowin production schedules with less cost, less effort, le maintenance work.

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SOAKING PIT CRANES • STRIPPER CRANES • SLAB AND BILL
CHARGING MACHINES • OPEN HEARTH CHARGING MACHIN
SPECIAL MILL MACHINERY • STRUCTURAL FABRICATI

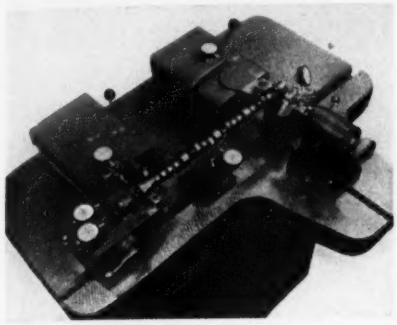
THE ALLIANCE MACHINE COMPANY

MAIN OFFICE: ALLIANCE, OHIO • PITTSBURGH OFFICE: 1622 OLIVER BUILDING, PITTSBURGH, PA

New Products and Equipment

Gear, Cam Shaft Checker

A check of those cam shaft elements which must be held to close dimensional limits is accomplished by the Red Ring combination gear and cam shaft checker, manufactured by National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich. In operation the cam shaft is laid on two journal bearing support



blocks and rotated by hand while readings are taken of the various elements to be checked.

Gears are tested for composite errors and eccentricity by rolling with a master gear. Tooth to tooth spacing is checked by a standard Red Ring gear checking head.

Check No. 1 on Reply Card for more Details

Drill Grinder

Standard 2, 3 and 4 flute drills of either straight or taper shank type ranging from No. 53 to 2½-inches may be sharpened to the standard 59 degree angle with the style CWA twist drill grinding machine recently

announced by Gallmeyer & Livingston Co., Grand Rapids, Mich. It is equipped with 12-inch diameter grinding wheels and with 1½-horsepower alternating current motor for spindle drive. V-belt drive makes it possible to operate at right spindle speed with line frequencies ranging from 25 to 60 cycles.

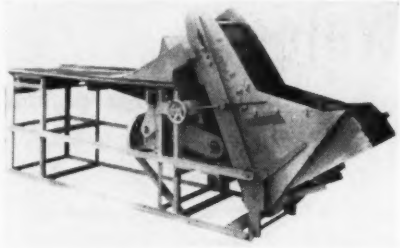
Rectangular lip rest which supports lip drills may be reversed from side to side or top to bottom if it becomes worn after repeated use. Diamond truing device for dressing face of grinding wheel makes it possible to automatically maintain proper relationship between holder and face of wheel. It is not necessary to swing holder out of position when dressing wheel.

Check No. 2 on Reply Card for more Details

Inspection Table

An elevator-hopper feeds any small, mass-produced articles onto a 2 x 8-foot conveyor belt of the inspection table, announced by D. H. Prutton Machinery & Tool Co., 5295 West 130th St., Cleveland, O. A multispeed transmission and a variable angle control allows any desired distribution on the table for the visual inspection operation.

Because it is designed for small parts, such as bolts, nuts, washers, etc., it is possible to inspect as many



as 130,000 pieces per hour. The inspection table requires 48 square feet of floor space and is built so that all moving parts are readily accessible.

Check No. 3 on Reply Card for more Details

Rotary Broach

Shearcut Tool Co., Box 746, Reseda, Calif., is announcing a rotary broach, designed to produce perfectly finished holes to exact size. The tool produces a shearcutting action by virtue of end pressure and rotation of the tool or work as it is fed into the work. It may be used in lathes, turret lathes, automatics, boring mills, milling machines, etc. Holes are held to limits of 0.0001-inch.

Broach will feed to the bottom of a blind hole. It is sharpened on the front end and also on the helical cutting flutes. The front end removes most of the metal, leaving from 0.006 to 0.010-inch to be removed by the short sharpened taper section on the front cutting edge of the helical land. Stock sizes start at $\frac{3}{8}$-inch and are increased by $\frac{1}{32}$-inch to 1 inch. From 1 to 1½-inch increments are $\frac{1}{16}$-inch. Special sizes will be made to order.

Check No. 4 on Reply Card for more Details

Lift Truck

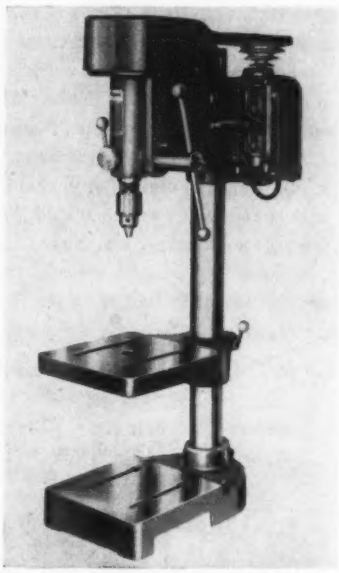
Important features of the lift truck made by W. F. Hebard & Co., 336 W. 37th St., Chicago 9, Ill., are unobstructed vision when traveling with load and a free lift of 55 inches with an overall height of 83 inches. The model F50 of 5000 pounds capacity is rated at 20 inches from heel of forks and has a telescoping lift of 110 inches.

Other dimensions include overall width 40 inches, overall length less forks 85 inches and outside turning radius 88 inches. An International Harvester U-4 engine is used to power the truck.

Check No. 5 on Reply Card for more Details

Drill Press

Depth stop which operates directly on the feed pinion between the two lower quill bearings, thus eliminating any side thrust or consequent deflection of drill point and a quick setting gage calibrated in sixteenths are features of a 15-inch drill press manufactured by Reypo Corp., 5751 West 98th St., Los Angeles 45, Calif. Spindle has a travel of 4 inches with



four speeds from 630 to 4850 revolutions per minute.

Free floating drive prevents whip or misalignment and is carried in two

For STAMINA and ABRASION RESISTANCE at LOW COST

C.M.I. Coal Dryers are Welded with GENEX and HARDEX

Structurally the cleverly designed coal dryers built by Centrifugal & Mechanical Industries of St. Louis stand up under severe impact and vibration in their work of drying more than 75 tons of coal per hour. Genex is used in the fabrication of these remarkable units because it assures welds of more than ample strength and too because among E-6012 electrodes it is outstandingly economical in operation. It is easy to handle . . . Spatter loss is low . . . and the electrode can be used at appreciably higher currents than normal *without overheating*.

Another notable feature of these C. M. I. units is the hard facing of every surface which comes in contact with coal in motion. Here because it is economical in cost and is as easy to use as a Mild Steel electrode, Hardex 60 is employed for overlaying an extremely tough abrasion resistance deposit on rotor vein guides, etc.

Among the 90 odd electrodes in the M & T line there is sure to be one or more which can bring similar advantages to your welding operations. Write for more details today.

METAL & THERMIT CORPORATION

120 BROADWAY • NEW YORK 5, N. Y.

Albany • Chicago • Cincinnati • Cleveland • Houston • Newark
Philadelphia • Pittsburgh • So. San Francisco
Minneapolis • Toronto

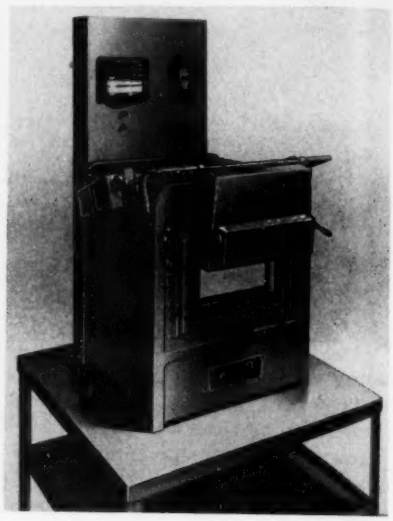
MUREX WELDING ELECTRODES
M&T ELECTRODES and GAS RODS
M&T WELDING ACCESSORIES

sealed ball bearings. Drive is through involute splines and mating involute keys. Two additional sealed ball bearings carry spindle.

Check No. 6 on Reply Card for more Details

Electric Box Furnace

Temperatures in the range from 300 to 2000° F are available in the model VK-6 electric box furnace made by Cooley Electric Mfg. Corp., 38 South Shelby St., Indianapolis, Ind. The range permits hardening and other high temperature work, as



well as low temperature applications, such as tempering, drawing of steels, nonferrous heat treating, etc. Chamber of the furnace measures 8 x 6 x 14 inches. It has a vertical lift door with exterior mechanism and counterweights.

Power capacity is 4650 watts. Only 2½-kilowatts are required to maintain 2000° F. Uniform heating is assured by six embedded-type heating elements, including one in the door. Maximum temperature is reached from cold in 1½-hours. A selective power modifier, used in combination with an indicating-controlling pyrometer, permits meeting critical temperature requirements. Power input may be adjusted to balance furnace heat losses. Either a wall mounted pyrometer or the illustrated control panel may be employed.

Check No. 7 on Reply Card for more Details

Wet Cleaning Mill

The continuous automatic star return wet cleaning mill for foundries, designed by N. Ransohoff Inc., Cincinnati, O., cascades the casting in a mass of stars to remove the sand. Hot water fortified with a rust inhibitor is circulated through the mill at all times to eliminate the possibility of any rust forming and to flush

the sand out of the mill as fast as the stars can remove it from the casting.

Work is discharged onto a conveyor from the shake-out and is conveyed to the mill's loading end where it is fed continuously into the mill. At the same time the stars are fed in at the same point. The discharge end has a pick-up bucket which ejects a measured amount of castings and

stars into the separating section. Work proceeds through the mill onto a sorting conveyor, the stars returning to the loading end of the machine. Sand is flushed into settling tanks and removed by conveyors. Water is returned to charging end of machine for reuse.

Check No. 8 on Reply Card for more Details

Whiteprinting Machine

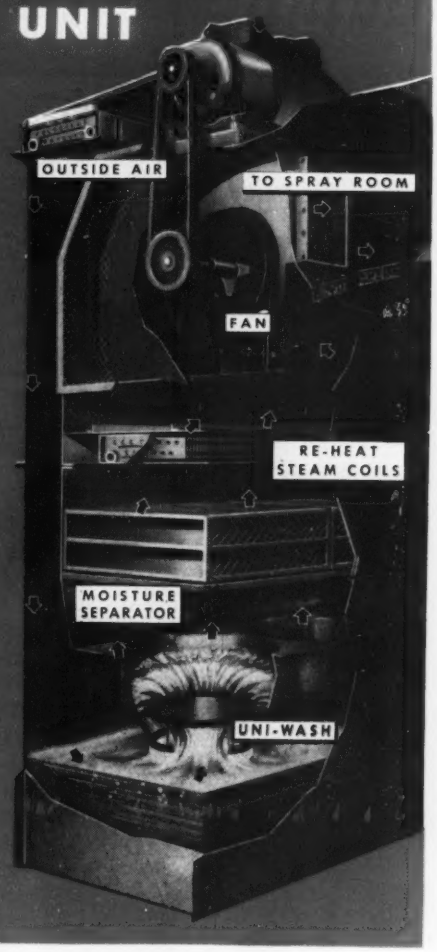
Moderate volume production whiteprint production of engineering drawings in ink or pencil or typewritten office forms from translucent or transparent original material may be attained with new Model 21 BW whiteprinter currently being manufactured by Charles Bruning Co. Inc., 4754-22 Montrose Ave., Chicago 41, Ill. It exposes and develops cut

sheets or roll stock up to 42 inches in width and any length. Printing speeds range from 6 inches to 4 feet per minute depending on transparency of original. Machine can produce more than three thousand 8½ x 11 whiteprints per day.

Machine can be installed anywhere in plant or office where electric outlets are available, requiring no plumb-

ONE COMPACT UNIT SUPPLIES

Air... WASHED • DRIED • HEATED



NEWCOMB-DETROIT

AIR SUPPLY UNIT

NEWCOMB-DETROIT

Pre-Assembled —Factory Tested

A pre-assembled, factory-tested air supply system that washes, dries and heats air within one compact unit . . . another Newcomb-Detroit first. These units are available in capacities from 5000 to 30,000 CFM and can be used individually or in combination wherever clean, fresh air is required in industrial processing. These units eliminate the costly construction and maintenance of a central plenum chamber. And, when necessary, they can be easily moved to a new location in the plant *as a unit.*

Uni-Wash Air Supply units are in operation in several large plants. *Often they are re-circulating 50% of the exhaust air from spray booths . . . saving up to one half in winter heating costs.* Write today for complete information on these economical units.

Established 1912

NEWCOMB-DETROIT COMPANY

NEWCOMB-DETROIT

Grand Rapids Division—Plant
GRAND RAPIDS, MICH.

Main Office and Plant
5741 Russell Street
DETROIT 11, MICHIGAN

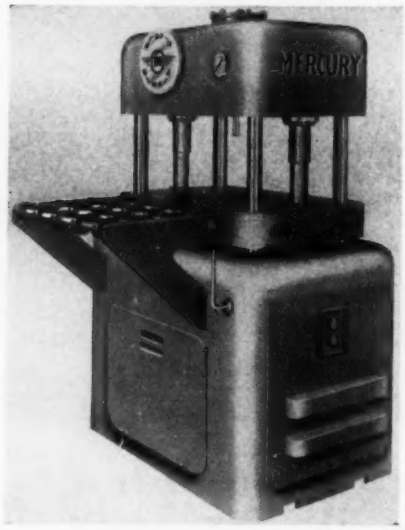
Western Sales Office
CHICAGO, Ill.

ing connections or exhaust ducts. Light source for exposure is a stationary 1200 watt glass mercury arc lamp mounted within a cylinder having sufficient length to provide ample and uniform distribution of light over entire exposure area.

Check No. 9 on Reply Card for more Details

Hydraulic Press

Feature of the series H hydraulic press, developed by Mercury Engineering Corp., 2100 North Farwell Ave., Milwaukee, Wis., is the traveling lower platen which moves vertically under hydraulic pressure. The upper platen carries the dies in fixed positions and is provided with either air or spring knock-outs to facilitate unloading. Hydraulic unit of the all-



welded press is in the base. All controls are panel mounted.

Model HD-25 machine has a 20 x 24-inch upper and lower platen and is rated at 25 tons with fifteen 1-inch or three 5-inch strokes per minute. Stroke is varied by a hand control. It can be equipped with cutting dies, ruled dies, or special tooling as required. Mounting pads provide for feed and delivery tables, special fixtures, etc.

Check No. 10 on Reply Card for more Details

Valve and Tool Grinder

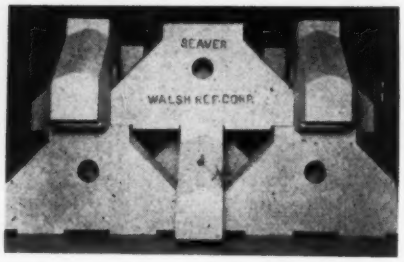
Black & Decker Mfg. Co., Towson 4, Md., is introducing its No. 6 universal valve and tool grinder which is equipped with a double ended wheel spindle, making it possible to grind rocker arms, valve stems and tappets with the aid of attachments, included as standard equipment. Flat head and 15 degree valves may be handled. Valve stem capacity ranges from ¼ to 1¼-inches and valve head capacity is 5¼-inches.

Features of the grinder include an instant gripping air chuck, a controlled speed work heat motor which is adjustable to accommodate large and small sized valve heads and a switch slide bar which automatically stops work head motor when table moves away from the wheel. Wheel head assembly can be removed and replaced with special attachments for internal grinding. Standard equipment includes five twin-grip collets, collet push rod and nose piece, rocker arm grinding attachment, diamond wheel dresser, cutter type wheel dresser, micrometer valve stem grinding attachment and a universal depth gage.

Check No. 11 on Reply Card for more Details

Checker Brick

Originally designed to increase the heating surface of hot blast stoves, a new checker brick being manufactured by Jay J. Seaver Engineers, 53 West Jackson Blvd., Chicago 4, Ill., has been found equally applicable to installation on open hearths, soaking pits, water gas sets and similar applications where increased surfaces are desirable to provide greater heating areas and increased product-



ive capacity. See STEEL, p. 108, July 26, 1948.

Each brick is securely locked top and bottom with other brick and cannot move in any direction when it is laid up in a standard basket weave pattern. Heating surfaces are increased 30 per cent and 90 per cent of the volume is exposed. Brick cannot twist or turn and may be used with or without tubular inserts.

Check No. 12 on Reply Card for more Details

• • •

CENTRIFUGAL PUMPS: Single and two-stage units ranging from ¼ to 75 horsepower and from 10 to 2500 gallons per minute, including self-priming types, suitable for a variety of applications and viscosities comprise the line of centrifugal pumps made by Bowser Inc., Fort Wayne 2, Ind. Four models are offered. Pump constructions are all iron, bronze fitted or all bronze with steel shafts. Impellers are open or closed.

Check No. 13 on Reply Card for more Details

HYDRAULIC COUPLING: Cartridge-mounted shaft bearings are an integral part of the Fluidrive hydraulic coupling, announced by Crane-Veyor Corp., Los Angeles, Calif. It is a completely self-contained unit, with simple impeller element and runner unit, mounted on its own integrally fitted ball bearings. Easily installed, it is available in capacities up to 5 and 7½-horsepower.

Check No. 14 on Reply Card for more Details

CRIMPING TOOL: Aircraft-Marine Products Inc., 1597 North 4th St., Harrisburg, Pa., is producing the Ampli-Crimp, a heavy duty hand tool for installing Solistrand terminals on solid or stranded wire in sizes 12 to 4. It features interchangeable crimping inserts, compound leverage and full toggle action. It has heat treated jaws.

Check No. 15 on Reply Card for more Details

WHEEL CEMENT: Flexibility and high adhesive strength are features of Wheel King polishing wheel cement, produced by Wallace A. Erickson & Co., Chicago 10, Ill. It is made in one form for use with all grain sizes to 240. Shipment is in ready-to-use form and application is cold.

Check No. 16 on Reply Card for more Details

CUTTING OIL: A cutting oil which at the same time eliminates the need of further rust prevention treatment of tools, machinery, etc., is Ferox, introduced by Beacon Rust Proofing Co., New York, N. Y. For most metals it is mixed with 49 parts water. Cast and malleable iron require one to 33 parts water, while threading and cutting require one to 35. Solution remains completely clear at all times.

Check No. 17 on Reply Card for more Details

CARBIDE BUSHINGS: Serving as wear resistant parts where either inside or outside diameter is critical, standard all purpose carbide bushings, made by Carboloy Co. Inc., Detroit 32, Mich., are available in various sizes and carbide grades from stock. Smaller bushings are of Carboloy grade 883; larger sizes of grade 44A.

Check No. 18 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

STEEL SUPPLY— Increasingly tight supply conditions are indicated over remainder of the year. Despite prospects for high sustained production in fourth quarter, rank and file consumers are expressing growing concern over the the possibility their tonnage quotas for final period may be reduced.

Fear stems from expected expansion in tonnage allotments under the voluntary allocation plan. Increases in such tonnage, it is thought, may more than offset gains in steel output. Currently, allocations account for about 300,000 tons monthly, but indications are by fourth quarter such tonnage will be increased almost half again as much with four new programs nearing the effective stage. At present, allocation of an additional 160,000 tons monthly is under discussion, and 10 more programs are under preliminary study. Further it has been ruled allocations made prior to Mar. 1 under the present law will continue operative until Sept. 1, 1949.

DISTRIBUTION— Shift to mill pricing also may affect consumers' tonnage over coming months. Abandonment of basing point pricing may redound to the advantage of some consumers, but it undoubtedly will cause others to lose tonnage. Those farthest from supply sources stand to suffer most. Mills have been withdrawing from distant markets for some time past and with the change to mill pricing this tendency is likely to be accentuated.

RECORD SHIPMENTS— Shipments of finished steel in first half of this year were record-breaking. Total movement exceeded 32,500,000 net tons, exceeding the record in the last half of 1947 by nearly 371,000 tons, and topping shipments in first half of last year by more than 1 million tons. Wartime high was established in first half of 1944 at 31,766,000 tons.

If producers continue to ship during the remainder of 1948 at the record rate of the first six months, year's total movement will approximate 64,500,000 tons. Previous high was 63,250,000 in 1944. Sheet and pipe shipments were chiefly responsible for the gain over 1947.

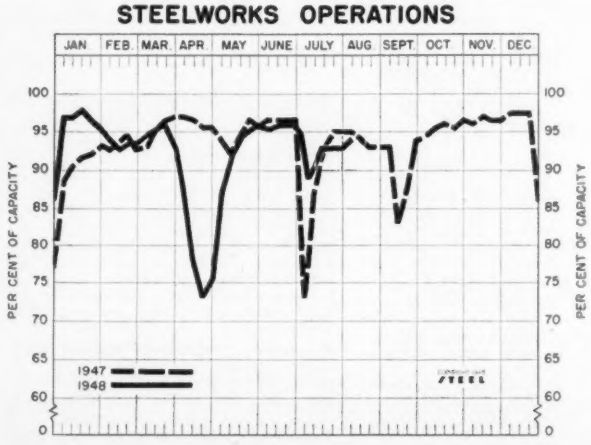
STEEL PRICES— Upward movement in prices has not yet fully run its course. Several smaller producers issued new price schedules over the past week. In the main these conform with lists announced two weeks ago by the large companies. For the moment it appears major changes have about been completed. Despite talk of further advances in event production costs continue to rise only minor adjustments are in prospect at this time in the form of revisions to meet competitive conditions.

Last week advances applied principally to specialties with increases being effected on stainless and tool steels of about 10 per cent on base prices and extras. Substantial increases also were made on bolts and nuts. Also, one large steelmaker revised extras on hot and cold-rolled sheet and strip.

STEEL'S finished steel composite held at $90.05 last week which was the revised figure for the preceding week. In the like week of 1947 this composite stood at $75.41. The semifinished steel composite also was unchanged at $74.85 and compared with $56.80 a year ago. The pig iron composite rose to $43.86 from $43.36 the preceding week and compared with $35.61 in the like week a year ago. Scrap is firmly established at the new formula level, holding at $43.33 against $41.75 in the like 1947 week.

RAW MATERIALS— Scramble for raw materials continues. Pig iron appears in increasingly short supply. Some buyers are acquiring small lots of imported iron for which they are paying high prices to supplement domestic supplies. Closing down of the New England blast furnace is forcing buyers in that area to reach out frantically into other producing districts for supplies. Undertone of the scrap market is strong with an increase in prices on boundary grades expected.

STEELWORKS OPERATIONS



DISTRIBUTION STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended Aug. 7	Change	Same 1947	Week 1946
Pittsburgh	93.5	+ 1	98.5	97.5
Chicago	90.5	+ 1	94	89.5
Eastern Pa.	90	None	94	84
Youngstown	103	+ 1	92	88
Wheeling	92.5	+ 10	93.5	86
Cleveland	88.5	— 10.5	91	92
Buffalo	99	None	88.5	88.5
Birmingham	100	None	99	99
New England	85	+ 2	90	75
Cincinati	103	None	87	89
St. Louis	80	+ 2	84.5	49.5
Detroit	100	+ 2	92	89
Estimated national rate	94	+ 1	95	89

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Aug. 7	July 31	Month Ago July 1948	Year Ago Aug. 1947	5 Years Ago Aug. 1943
Finished Steel	$90.05	$90.05	$87.78	$75.41	$56.73
Semifinished Steel	74.85	74.85	71.11	56.80	36.00
Steelmaking Pig Iron	43.86	43.36	41.42	36.06	23.00
Steelmaking Scrap	48.33	48.33	41.43	39.00	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

July 1948	3.79216c
June 1948	3.58150c
July 1947	3.20098c
July 1943	2.45880c

***STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (rerolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

†FINISHED STEEL WEIGHTED COMPOSITE: Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. June and July, 1948 figures are preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton; others dollars per gross ton.

Finished Materials

	Aug. 7, 1948	July 1948	May 1948	Aug. 1947
Steel bars, Pittsburgh mills	3.45c	3.105c	2.875c	2.90c
Steel bars, del. Philadelphia	3.79	3.545	3.365	3.28
Steel bars, Chicago mills	3.35	3.065	2.875	2.90
Shapes, Pittsburgh mills	3.25	2.975	2.775	2.80
Shapes, Chicago mills	3.25	2.965	2.775	2.80
Shapes, del. Philadelphia	...	3.18	2.98	2.94
Plates, Pittsburgh mills	3.50	3.155	2.925	2.95
Plates, Chicago mills	3.40	3.115	2.925	2.95
Plates, del. Philadelphia	3.71	3.41	3.21	3.15
Sheets, hot-rolled, Pittsburgh mills	3.275	2.975	2.775	2.80
Sheets, cold-rolled, Pittsburgh	4.00	3.70	3.50	3.55
Sheets, No. 10 galv., Pittsburgh	4.40	4.10	3.90	3.90
Sheets, hot-rolled, Gary mills	3.25	2.965	2.775	2.80
Sheets, cold-rolled, Gary mills	4.00	3.70	3.50	3.55
Sheets, No. 10 galv., Gary mills	4.40	4.10	3.90	3.90
Strip, hot-rolled, Pittsburgh mills	3.275	3.140	3.05	2.80
Strip, cold-rolled, Pittsburgh mills	4.00	3.875	3.775	3.55
Bright basic, wire, Pittsburgh	4.15	3.965	3.725	3.675
Wire nails, Pittsburgh mills	5.15	5.25	5.125	4.25
Tin plate, per base box, Pittsburgh	$6.70	$6.68	$6.60	$5.75

Semifinished

Sheet bars, Chicago mills	$67.00	$62.80	$60.00	$53.57
Slabs, Pittsburgh, Chicago	52.00	47.80	45.00	40.18
Rerolling billets, Pittsburgh	52.00	47.80	45.00	40.18
Wire rod 7/32 to 1/4-inch, Pitts.	3.45c	3.419c	3.175c	2.925c

Pig Iron

	Aug. 7, 1948	July 1948	May 1948	Aug. 1947
Bessemer, del. Pittsburgh (N.&S. sides)	$44.08	$44.08	$41.038	$37.83
Basic, Valley	43.00	40.60	39.00	36.00
Basic, eastern del. Philadelphia	46.17	43.77	42.17	38.72
No. 2 fdry., del. Pgh. (N.&S. sides)	43.58	43.58	40.538	37.33
No. 2 fdry., del. Philadelphia	46.67	44.27	42.67	39.22
No. 2 foundry, Chicago	43.25	41.10	39.00	36.00
No. 2 foundry, Valley	43.50	41.10	39.50	36.50
Southern No. 2 Birmingham	43.38	40.72	38.63	34.51
Southern No. 2 del. Cincinnati	49.09	46.43	43.90	39.38
Malleable, Valley	43.50	40.30	39.50	36.50
Malleable, Chicago	43.50	41.50	39.50	36.50
Charcoal, low phos., fob Lyles, Tenn.	62.00	59.60	56.50	44.00
Ferromanganese, fob cars, Pittsburgh	148.00*	151.15	151.15	140.25

* Fob Aetna, Pa.

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.25	$40.75	$40.25	$39.50
Heavy melt. steel, No. 2, E. Pa.	41.50	40.00	39.00	38.35
Heavy melt. steel, No. 1 Chicago	41.75	40.05	39.25	39.625
Heavy melt. steel, No. 1 Valley	42.75	40.75	40.25	40.50
Heavy melt. steel, No. 1, Cleveland	42.25	40.25	39.75	38.81
Heavy melt. steel, No. 1 Buffalo	45.50	44.30	43.00	40.88
Rails for rerolling, Chicago	62.50	57.80	51.75	47.125
No. 1 cast, Chicago	70.00	68.50	66.00	43.50

Coke

Connellsville, beehive furnace	$14.25	$14.25	$12.94	$12.00
Connellsville, beehive foundry	17.00	17.00	15.06	14.50
Chicago, oven foundry, ovens	19.86	20.75	18.50	18.50

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $100-105 per gross ton. Forging quality $50 per net ton.

Alloy Steel Ingots: $51 per net ton, mill. Johnstown, Pa.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except $62, Conshohocken, Pa., mill; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $68, Conshocken, Pa., mill.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill.

Sheet Bars: $67 nom., per net ton, mill; sales in open market $110-$115 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

Wire Rods: Basic and acid open-hearth, 7/32 & 3/8-inch, inclusive, 3.40c per lb, mill, except: 3.70c, Worcester mill; 4.05c, Pittsburg, Calif.; 4.10c, Portsmouth, O., mill; 4.15c, Monessen, Pa., mill. Basic open-hearth and bessemer, not resulphurized, 7/32 to 47/64-inch, inclusive, 3.50c, mill.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in. (Base 20 tons one size): 3.35c, mill, except: 3.55c, Ecorse, Mich., Monessen and Aliquippa, Pa., mills; 3.35-3.55c, Pittsburgh mills; 4.05c, Pittsburg and Torrance, Calif., mills.

Rail Steel Bars: (Base 10 tons): 3.35c, mill.

Hot-Rolled Alloy Bars: 3.75c, mill.

Hot-Rolled Alloy Bar Shapes: 4.00c, mill.

Cold-Finished Carbon Bars (Base 20,000-39,999 lb): 4.00c, mill, except: 3.95c, Pittsburgh mill; 4.25c, Monessen, Pa., mill; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Mass., Beaver Falls, Pa., and Massillon, O.; 4. 45c, Camden, N. J., mills.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.75c, Monessen, Pa., mill; 4.95c, Worcester, Mass., mill.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.40c, Ecorse, Mich., mill.

Reinforcing Bars (New Billet): To fabricators: 3.35c, mill, except: 3.55c, Monessen, Pa., mill; 4.05c, Pittsburg and Torrance, Calif., mills. To consumers: 4.10c, mill.

Reinforcing Bars (Rail Steel): 4.65c, mill.

Iron Bars: Single Refined: 8.60c, (hand puddled), Pittsburgh mill; 9.50c, Economy, Pa., mill. Double Refined: 11.25c (hand puddled), Pittsburgh mill; 11.00c, Economy, Pa., mill. Staybolt: 12.50c, (hand puddled), Pittsburgh mill 11.30c, Economy, Pa., mill.

Hot-Rolled Ingot Iron Bars: 3.60c, mill.

Sheets

Hot-Rolled Sheets (18 gage and heavier): 3.25c, mill, except: 3.25-3.30c, Pittsburgh and Cleveland, mills; 3.45c, Ecorse, Mich., mill; 3.95c, Pittsburg and Torrance, Calif., mills; 5.00c, Conshohocken, Pa., mill.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 5.05c, Torrance, Calif.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Granite City, Ill., and Ecorse, Mich., mills; 4.95c, Pittsburg, Calif., mill.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 4.60c, Granite City, Ill., mill; 5.15c, Pittsburg and Torrance, Calif., mills.

Galvannealed Sheets: 4.95c, mill.

Culvert Sheets, No. 16 flat (based on 5-cent zinc; corrugated 10 cents extra): Copper alloy: 5.00c, mill, except: 5.40c, Granite City, Ill., mill; 5.75c, Pittsburg and Torrance, Calif., mills.
Copper-iron or pure iron: 5.35c mill, except 5.75c, Granite City, Ill., mill.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: 7.75c, mill.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Long Ternes Ingot Iron: 5.20c, mill.

Enameling Sheets, No. 12: 4.40c, mill, except: 4.60c, Granite City, Ill., mill; 4.70c, Ecorse, Mich., mill.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill, except: 5.65c, Granite City, Ill., mill.
Electrical: Hot-rolled, 5.95c, mill, except: 6.15c, Granite City, Ill., mill. Could-rolled, 6.20c, mill.
Motor: 6.70, mill, except: 6.90c, Granite City, Ill., mill; 7.20c, Brackenridge, Pa., mill.
Dynamo: 7.50c, mill, except: 7.60c, Granite City, Ill., mill; 7.90c, Brackenridge, Pa., mill.
Transformer 72, 8.05c, mill, except: 8.90c, Brackenridge Pa., mill. 65, 8.65c, mill, except: 9.60c, Brackenridge, Pa., mill. 58, 9.30c, mill, except: 10.30c, Brackenridge, Pa., mill. 58, 9.30c, mill; 52, 10.10c, mill.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.25c, Ecorse, Mich., and Conshohocken, Pa., mills.
Galvanized (No. 10), 6.75c, mill.
Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich., mill.

Hot-Rolled Drum Body Sheets: 3.95c, mill.

Oven Lining Sheets: 5.10c, mills.

Well Casing Sheets: 4.75c, mill,

Ingot Iron Sheets (18 gage and heavier): Hot-rolled, 3.50c, mill Cold-rolled, 4.50c, mill. Galvanized, 4.65c, mill, except: 4.95c, Indiana Harbor, Ind., mill.

Strip

Hot-Rolled Strip: 3.25c, mill, except: 3.25-3.30c, Chicago, Cleveland mills; 3.45c, Ecorse, Mich., mill; 3.70c, Wes Leechburg, Pa., mill. 4.00c, Pittsburg and Torrance, Calif., mills.
Cold-Rolled Strip (0.25 carbon and less): 4.00c, mill, except: 4.00-4.25c, Chicago mills; 4.20c, Ecorse, Mich., mill, 4.50c, New Haven, Conn., West Leechburg, Pa., mill.
Hot-Rolled Alloy: 5.10c, mill.
Cold-Rolled Alloy Strip: 9.50c, mill, except 9.80c, Worcester, Mass., mill.
Cold-Finished Spring Steel: 0.26-0.40 carbon, 4.00c, mill; over 0.40 to 0.60 carbon, 4.40c, mill; over 0.60 to 0.80 carbon, 6.10c; over 0.80 to 1.05, 8.05c; over 1.05 to 1.35, 10.35c; add 0.30c for Worcester mill.
High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.25c, Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich., mill.
Ingot Iron Strip: Hot-rolled, 3.50c, mill.

Tin, Terne Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $6.60-$6.80; 1.50 lb coating $6.80-$7.00.
Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, $5.80-$6.00; 0.50 lb tin, $6.00-$6.20; 0.75 lb tin, $6.20-$6.40.
Can Making Black Plate: Per base box of 100 lb, 55 to 70 lb basis weight, $5.20-$5.30; 75 to 95 lb basis weight, $5.10-$5.20; 100 to 128 lb basis weight, $5.20-$5.30.
Holloware Enameling Black Plate: 29-gage, 4.75-4.95c per lb.
Manufacturing Ternes (Special Coated): Per base box of 100 lb, $5.90-$6.10. Granite City, $6.
Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $15.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.40-3.60c. Pittsburgh and Cleveland mills; 3.45c, Sparrows Point, Md.; 3.65c, Ecorse, Mich., mill; 3.75c, Coatesville, Pa., mill; 3.95c, Claymont, Del., and Conshohocken, Pa., mills; 5.85c, Harrisburg, Pa., mill.
Floor Plates: 4.55c, mill.
Open-Hearth Alloy Plates: 4.40c, mill, except: 5.10c, Coatesville, Pa., mill.
Clad Steel Plates (10% cladding): Coatesville mill: Nickel clad, nom.; inconel-clad, nom.; monel-clad, nom.
Wrought Iron: Nom., Economy, Pa.
High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.10c, Coatesville, Pa., mill; 5.30c, Conshohocken, Pa., Sparrows Point, Md., and Johnstown, Pa., mills; 5.65c, Ecorse, Mich., mill.
Ingot Iron Plates: Carlots, 3.65c, mill; l.c.l., 4.15c, mill.

Shapes

Structural Shapes: 3.25c, mill, except 3.30c, Bethlehem, Pa., Lackawanna, N. Y. and Johnstown, Pa., mills; 3.85c, Torrance, Calif., mill.
Beams, Wide Flange: 3.20c, mill, except: 3.30c, Bethlehem, Pa., mill.
Alloy Structural Shapes: 4.05c, mill.
Steel Sheet Piling: 4.05c, mill.
High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem and Johnstown, Pa., and Buffalo mills.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.24c, Sparrows Point, Md., mill; 4.45c, Worcester, Mass., mill; 4.50c, Monessen, Pa., mill; 4.70c, Portsmouth, O., mill; 5.10c, Pittsburg, Calif., mill.
Basic MB Spring Wire, 5.55c, mill, except: 5.65c, Sparrows Point, Md., Monessen, Pa., mills; 5.85c, Worcester, Mass., Trenton, N. J., mills; 6.50c, Pittsburg, Calif., mill.
Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa., mills; 5.50c, Worcester, Mass., Trenton, N. J. New Haven, Conn., mills; 615c, Pittsburg, Calif., mills.
Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90, Sparrows Point, Md., mill; 4.95c, Monessen, Pa., mill; 5.10c, Worcester, Mass., mill; 5.75, Pittsburg, Calif., mill. Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md., mill; 5.40c, Moneessen, Pa., mill; 5.55c, Worcester, Mass., mill; 6.20c, Pittsburg, Calif., mill.
Flat Wire: 5.00c, mill, except: 5.30c, Worcester, Mass., mill.
Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Column 103, mill, except: Column 105, Sparrows Point, Md., mill; Column 109 Worcester, Mass., mill; Column 117, Portsmouth, O., mill; Column 123, Pittsburg, Calif., mill; $5.20 per 100 pound keg, Aliquippa, Pa., mill. $6.75, Conshocken, Pa., mill. $4.77 per 100 lb., Willimsport, Pa.
Woven Fence (9 to 15½ Gage, inclusive): Column 109, mill, except Column 132, Pittsburg, Calif., mill.
Barbed Wire: Column 123 mill, except: Column 125, Sparrows Point, Md., mill; Column 143, Pittsburg, Calif., mill.
Fence Posts (with clamps): Column 114, Duluth; Column 115, Johnston, Pa., $123.50 per net ton, Williamsport, Pa.
Fence Posts (with clamps): Column 114, Duluth; Column 115, Johnstown, Pa.; $123.50 per net ton, Williamsport, Pa.
Bale Ties (single loop): Column 106, mill, except: column 108, Sparrows Point, Md., mill; Column 130, Pittsburgh, Calif., mill.

Rails, Supplies

Rails: Standard, over 60-lb: $3.20 per 100 lb, mill.
Light billet): $3.55 per 100 lb, mill.
Light (rail steel): $4.77 per 100 lb., Williamsport, Pa.
Girder Rails: No. 1, 3.70c, mill; No. 2, 3.60c, mill.
Relaying, 60 lb and over: $60-$65 per net ton, f.o.b. warehouse.
Railroad Supplies: Track bolts, $7.50 per 100 lb., mill, except: $8.25, untreated, and $8.50, treated, Bethlehem, Pa., mill.
Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Calif., mill.
Splice Bars: 4.25c, mill.
Standard Spikes: 5.25c, mill, except: 5.35c, Fairfield, Ala., Indiana Harbor, Ill., Lebanon, Pa., mills.
Bolt Spikes: 615c, mill.
Axles: 5.20c, mill.

Tubular Goods

Standard Steel Pipe: Mill prices in carlots, threaded and coupled, to consumers about $200 a net ton.

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Butt Weld Blk.	Butt Weld Gal.
⅛	39½	12	1	47½–48½	31½–32½
¼	39½	16½	1¼	48–49	32–33
⅜	36	12	1½	48½–49½	32½–33½
½	42–43	24½–25½	2	49	33
¾	45–46	28½–29½	2½, 3..	49½	33½

In.	Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2	39½	23	39	22½	38½	22
2½ & 3	43½	27	42	25½	41½	25
3½-6	46½	30	44	27½	43½	27

Line Steel Pipe: Mill price in carlots to consumers about $200 a net ton.

In.	Butt Weld	In.	Butt Weld
⅛	38½	1	46½-47½
¼	38½	1¼	47-48
⅜	35	1½	47½-48½
½	41–42	2	48
¾	44–45	2½ & 3	48½

In.	Lap Weld	Elec. Weld	Seamless
2	38½	38	47½
2½ & 3	41½	41	40½
3½-6	44½	44	43½
8	46½	46	45½
10	46	45½	45
12	42	44½	44

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Lap Weld Blk.	Lap Weld Gal.
⅜	+59½	+88	1¼	+22	+46½
½	+20½	+46	1½	+15½	+39
¾	+10½	+35	2	+ 7½	+30
1 and 1¼	+ 4½	+26	2½-3½	+ 5	+25.5
1½	— 1½	+22½	4	List	+19½
2	— 2	+22	4½-8	+ 2	+21
			9-12	+12	+30½

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24", inclusive.

O.D. In.	B.W. Ga.	Seamless Hot Rolled	Seamless Cold Drawn	Elec. Weld Hot Rolled	Elec. Weld Cold Drawn
1	13	....	13.39	13.00	13.00
1¼	13	....	15.87	13.21	15.39
1½	13	$15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2½	13	21.37	25.16	20.73	24.40
2½	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	37.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Pipe Cast Iron: Class B, 6-in. and over $79.50 per net ton, Birmingham; $84.50, Burlington, N. J.; $91.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

Bolts, Nuts

Add 19c per cwt in carlots, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅝ and ⅝ x 6-in. and shorter	37 off
¾-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 70-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅛-in. and smaller	41 off	.....
¼-in. and smaller	.....	38 off
½-in.-1-in.	39 off	.....
⅛-in.-1-in.	.....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in. and larger	....	28 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter	40 off
¾, ⅞, & 1 x 6 and shorter	35 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
Headless, ¼-in. and larger	31 off

Rivets

Fob Pitts., Cleve., Chicago, Birmingham	
Structural ½-in. and larger	6.75c
7/16-in. and under	48 off
Fob Lebanon, Pa.	
Structural ½-in. and larger	6.75c*
7/16-in. and under	48 off*

* Plus 19c per cwt in cl; 26c in lcl.

Washers, Wrought

Fob Pitts., Chicago, Philadelphia, to jobbers and large nut and bolt mfrs.....$1-$2 off

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.5c
18	4	3	...	...	114.5c
18	4	2	...	9	168.5c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

Stainless Steels

Mill prices, cents per lb, Waterleit, Dunkirk, Brackenridge, W. Leechburg, Baltimore and Buffalo, N. Y.

Grade	Bars, Wire, Shapes	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301	28.75	32.50	40.75	24.25	32.00
302	28.75	32.50	40.75	25.75	33.75
303	31.50	34.75	43.00	32.50	39.75
304	31.25	34.75	43.00	28.00	35.75
308	34.75	40.75	49.00	34.00	43.00
309	43.00	48.00*	56.25*	44.50	56.25
310	59.00	62.25†	63.25	52.25	67.25
316	48.00	53.00	57.25	47.85	57.25
321	34.75	40.75	49.00	35.25	45.75
347	39.75	45.75	54.00	39.50	50.25
431	23.25	26.50	34.75	21.00	27.00
440A	28.75	34.25	40.25	28.50	43.50
STRAIGHT CHROMIUM STEEL					
410	22.50	25.75	32.00	20.25	26.50
416	23.00	26.50	32.50	22.00	28.00
420	28.50	34.00	40.25	28.50	43.50
430	23.00	26.50	34.75	21.00	27.00
430F	23.75	27.00	35.25	22.50	29.75
442, 443	27.00	30.75	39.00	28.50	38.50
446	33.00	36.25	43.50	41.75	62.25
§501	10.00	14.25	19.25	14.25	20.25
§502	11.00	16.00	20.25	16.00	21.50
****STAINLESS CLAD STEEL (20%)**					
304	....	26.50	22.00	....	....
410	....	24.25	22.00	....	....
430	....	24.75	22.50	....	....
446	....	32.00	29.75	....	....

One producer quotes: † 3.50c higher. § Low chromium. **Fob Pittsburgh, Washington and Coatesville, Pa.; pliate prices include annealing, pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$44.00	$44.50	$45.00	$45.50
Newark, N. J., del.	46.39	46.89	47.39	47.89
Brooklyn, N. Y., del.	....	48.40	48.90	....
Philadelphia, del.	46.17	46.67	47.17	47.67
Birmingham, furnace	42.88	43.38	....	....
Cincinnati, del.	....	49.09	....	....
Buffalo, furnace	44.00	44.00	44.50	45.00
Boston, del.	52.42	52.42	52.92	....
Rochester, del.	46.22	46.22	46.72	47.22
Syracuse, del.	47.025	47.025	47.525	48.025
Chicago, furnace	42.50-43.00	43.00-43.50	43.50	44.00
Milwaukee, del.	44.22-44.72	44.72-45.22	45.22	45.72
Muskegon, Mich., del.	....	49.65-50.15	50.15	....
Cleveland, furnace	43.00	43.50	43.50	44.00
Akron, del.	45.17	45.67	45.67	46.17
Duluth, furnace	43.00	43.50	44.00	44.50
Erie, Pa., furnace	42.50	43.00	43.50	44.00
Everett, Mass., furnace	....	48.75	49.25	....
Geneva, Utah, furnace	43.00	43.50	....	....
Seattle, Tacoma, Wash., del.	....	50.63	....	....
Portland, Oreg., del.	....	50.63	....	....
Los Angeles, San Francisco.	50.13	50.63	....	....
Granite City, Ill., furnace	45.25	45.75	46.25	....
St. Louis, del.	46.00	46.50	47.00	....
‡**Neville Island, Pa.,** furnace.	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	43.00	43.50	43.50	44.00
Sharpsville, Pa., furnace	43.00	43.50	43.50	44.00
Steelton, Pa., furnace	44.00	44.50	45.00	45.50
Struthers, O., furnace	42.50	....	....	....
Swedeland, Pa., furnace	45.00	45.50	46.00	46.50
Toledo, O., furnace	42.50	43.00	43.50	44.00
Cincinnati, del.	47.05	47.55	....	....
Youngstown, O., furnace	43.00	43.50	43.50	44.00
Mansfield, O.	46.87	47.37	47.37	47.87

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaco; $1.73 Verona; $1.94 Brackenridge; $1.08 to Ambridge and Aliquippa.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base) .$53.50
6.51-7.00 .$54.75
7.01-7.50 .56.00
7.51-8.00 .57.25
8.01-8.50 .58.50
8.51-9.00 .59.75
9.01- 9.50. 61.00
9.51-10.00. 62.25
10.01-10.50. 63.50
10.51-11.00. 64.75
11.01-11.50. 66.00

Fob Jackson, O., per gross ton; Buffalo furnace $4.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $78.75, Niagara Falls; $78 open-hearth and $79 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.05% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus.
Fob furnace, Lyles, Tenn. $62
(For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $50. Philadelphia $52.81, delivered. Intermediate phosphorus, Central furnace, Cleveland, $46.00.

Differentials

Prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $35; less than 60% $32.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$13.50-$15.00
Connellsville, foundry	16.00- 18.00
New River, foundry	16.50
Wise county, foundry	15.35
Wise county, furnace	14.60

† Nominal.

Oven Foundry Coke

Kearney, N. J., ovens	$21.50
Chicago, ovens	20.40
Terre Haute, ovens	21.00
Milwaukee, ovens	21.15
New England, del.	22.75
Birmingham, del.	17.86
Indianapolis, ovens	20.85
Cincinnati, del.	21.40
Ironton, O., ovens	18.25
Erie, Pa., del.	22.45
Painesville, O., ovens	20.90
Cleveland, del.	22.45
Buffalo, del.	23.10
Detroit, del.	21.65
Philadelphia, ovens	20.55
Swedeland, Pa., ovens	20.50
Portsmouth, O., ovens.	19.25

Coal Chemicals

Spot, cents per gallon

Pure and 90% benzol	21.00†
Toluol, two degrees	28.00
Industrial xylol	28.00
Solvent naphtha	28.00

Per pound fob works

Phenol (car lots, returnable drums)	13.00
Do., less than carlots	13.75
Do., tank cars	12.00

Eastern plants, per pound

Naphthalene flakes, balls, bbl. to jobbers, "household use"	12.00

Per ton, bulk, fob plants

Sulphate of ammonia	$40.00

Refractories

(Prices per 1000 brick, fob plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, or Farber, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., $100.

High-Heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, or Vandalia, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., $80.

Intermediate-Heat Duty; St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, Haldeman, or Athens, Ky., Troup, Tex., Stevens Pottery, Ga., or Portsmouth, O., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Pa., Bessemer, Ala., $66.

Ladle Brick

Dry Press: $50.
Wire Cut: $48.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., $83; Beach Creek, Pa., $73.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., $89; Lehi, Utah, Los Angeles, $95.
Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., $80.
Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)
Chrome brick or chemical-bonded chrome brick, $69, magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, fob works, Chewelah, Wash.)
Domestic dead-burned, ⅜" grains: Bulk, $31; single paper bags, $35.50.

Dolomite

(Base prices per net ton)
Domestic, dead-burned, bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibonsburg, Woodville, O., $11.85; Thornton, McCook, Ill., $11.95; Dolly Siding, Bonne Terre, Mo., $12.05.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R. R. freight rates, dock handling charges and taxes thereon effective after Apr. 1, 1948, are for buyer's account.)

Old range bessemer	$6.80
Old range nonbessemer	6.45
Mesabi bessemer	6.35
Mesabi nonbessemer	6.20
High phosphorus	6.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

Swedish basic, 60 to 68%	14.50
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50-6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$28

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% to 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo., cont., Mines	$0.75

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS				PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	†H-R	†C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½" & up	H-R Alloy **4140	Structural Shapes§§	Carbon ⅝"-¾"	Floor ⅝" & Thicker
New York (city)	5.93	6.73	7.74	6.08-6.28	...	5.83	6.43	8.22	5.52-5.78	5.98	7.48
New York (c'try	5.73	6.53	7.54	5.88-6.08	...	5.63	...	...	5.32-5.58	5.78	7.28
Balt. (city)	5.43†	6.33	7.53	5.49	...	5.54	...	...	5.48	5.68	7.13
Balt. (c'try)	5.28†	6.18	7.38	5.34	...	5.39	...	...	5.33	5.33	6.98
Buffalo (city) ..	5.25	6.00[3]	7.75	5.70	...	5.35	6.05	...	5.25	5.61	...
Buffalo (c'try) ..	5.10	5.85[3]	7.60	5.55	...	5.20	5.90	...	5.10	5.46	...
Chicago (city) ..	5.20	5.90‡[3]	7.20	5.00	6.30	5.05	5.85	7.80[9]	5.05	5.25	6.70
Chicago (c'try) ..	5.05	5.75‡[3]	7.05	4.85	6.15	4.90	5.70	7.65[9]	4.90	5.10	6.55
Milwaukee (city).	5.37	6.07‡[3]	7.37	5.17	6.47	5.22	6.02	7.97[9]	5.22	5.42	6.87
St. Louis	5.19§	6.09[3]	7.29	5.19	6.49	5.24	6.04[12]	9.49	5.24	5.44	6.89
Birm'ham (city).	5.20§	...	6.60	5.20	...	5.15	6.66	...	5.15	5.40	7.41
Birm'ham (c'try	5.05§	...	6.45	5.05	...	5.00	6.51	...	5.00	5.25	7.26
Pitts. .....4.85-5.00§		5.75-5.85[3]	6.90-7.05	5.00-5.35	5.95-6.00	4.90-5.10	5.65	7.65	4.90-5.15	5.05-5.25	6.55
Cleveland (city) .5.13-5.75[23]		5.75-6.04†	7.33-7.85[23]	5.02-5.69	...	5.19-5.31[2]	5.95-6.05†	7.94	5.19-5.57	5.39-5.54†	6.84-6.99†
Cleveland (c'try).	4.98	5.85	7.18	5.54	...	5.19†	5.90†	7.79	5.42	5.39†	6.84†

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [15]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb; [23]—Price (but not other price in range) applies to any and all quantities.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ annealed §§ except wide flange beams, which are 0.05c lower; 12G. & heavier and includes machine straightening.

5.65

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $52, Palmerton, Pa., $56, Pittsburgh; (16% to 19% Mn.) $1 per ton lower. **Standard Ferromanganese:** (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, Alloy, W. Va., Welland, Ont., and Niagara Falls, N. Y.; $147 Johnstown, Pa., mill. Carload, lump, bulk, $150 fob Rockwood, Tenn.; $148 fob Aetna, Pa., or $148.65 within Pittsburgh switching limits. Add or subtract $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%. West Coast Prices: Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23.25c, ton lot 24.35c, less ton 25.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17.25c, ton lot 18.35c, less ton 19.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.5c per lb of alloy, carload packed, 8.55c, ton lot 9.45c, less ton 10.45; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 18.6c per lb of contained Cr, c.l., packed 19.5c, ton lot 20.65c, less ton 22.05c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l., 8MxD, bulk 20.1c per lb of cotnained Cr, c.l., packed 21.0c, ton lot 22.35c, less ton 24.1c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 28.5c per lb of contained Cr, 0.04% C 27.5c, 0.05% C 27.0c, 0.06% C 26.5c, 0.10% C 26.0c, 0.15% C 25.5c, 0.20% C 25.25c, 0.50% C 25.0c, 1% C 24.5c, 2% C 24.25c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 25c per lb of contained chromium, carload, packed 26.1c, ton lot 27.3c, less ton 29.1c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Mn. 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D; packed, max. 0.50% C grade, 93c per lb of contained chromium, ton lot 94.5c, less ton 97c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

20-30% Ferrosilicon: Contract, carload, lump, bulk, 16.50c per lb. of contained Si, fob Niagara Falls, N. Y.

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 9.3c per lb of contained Si, carload packed 10.9c, ton lot 12.35c, less ton 14.0c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (All 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 11.8c per lb of contained Si carload packed 13.1c, ton lot 14.25c, less ton 15.5c; Central, add 0.3c for c.l. add 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 13.3c per lb of contained Si, carload packed 14.55c, ton lot 15.55c, less ton 16.7c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% fersosilicon prices.

90% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 15c per lb of contained Si carload packed 16.2c, ton lot 17.15c, less ton 18.2c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe.) Eastern Zone, c.l., lump, bulk, regular 17.3c per lb of Si, c.l. packed 18.5c, ton lot 19.4c, less ton 20.4c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb cl 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c; smaller lots 8.65c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 12.5c per lb or briquet, carload packed 13.2c, ton lot 14.0c, less ton 14.9c; Central, add 0.25c for

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Copper Prices Rise Two Cents

Electrolytic market is quoted 21.50c to 23.50c with only one leading producer at the lower level. Brass mill product and scrap prices move higher

New York—All of the leading copper producers, with the exception of Kennecott Copper Corp., advanced primary copper prices two cents a pound last week to the basis of 23.50c, delivered Connecticut Valley, for electrolytic. This was the first advance in copper posted by a large producer since Mar. 4, 1947, and lifted the market to the highest level since 1929. During World War II, government regulations kept the price at 12.00c a pound compared with the 27-cent level to which it rose when the metal was uncontrolled in World War I.

The latest price revision, initiated late last month by three small high-cost producers, was followed quickly by advances in copper and brass mill product prices and in scrap. The three large-tonnage metals, therefore, have joined the upward price spiral, lead and zinc having advanced late last month.

Copper—Companies which quoted 23.50c for copper when they opened books for September business reported that sales were substantial at the new level. As a matter of fact, sellers were unwilling to accept all of the orders tendered. With supplies still inadequate to cover all requirements, especially in view of the government's stockpiling plans, demand is expected to show no easing in the immediate future. Toward the close of the week, the market was quotable at 21.50c to 23.50c a pound.

Brass Mill Products—Brass mill subsidiaries of the leading interests, except Kennecott, announced price advances of two cents a pound on copper products and proportionate advances on alloyed products. The new prices also reflect the recent advances of two cents a pound in pig lead and three cents in slab zinc. Price for yellow brass sheet, for example, was raised 1.33 cents a pound to 33.75c from 32.42c, while brass wire increased to 34.04c from 32.71c, f.o.b. destination.

Copper Scrap—Late last week, one of the principal refiners announced new buying prices for copper scrap to the following levels: No. 1 wire, 20.50c; No. 2, 19.25c; light copper, 18.25c; auto radiators, 13.50c to 13.75c; and refinery brass, 18.00c.

Lead—Supported to some extent by the downtrend in supplies as a result of labor difficulties at producing properties, the lead market remained strong last week at the 19.30 to 19.35-cent price level. The record high price level was no deterrent to buying by consumers who continued to accept all tonnages offered.

Smelter receipts of lead in ore and scrap during June declined to 44,858 tons from 47,812 in May, according to the American Bureau of Metal Statistics. Total receipts of lead in ore and scrap during the first six months of 1948 amounted to 261,756 tons, or about 8850 tons less than the total recorded for the like period a year ago. Receipts of lead in ore from domestic sources during June were off moderately to 34,689 tons from 37,625 tons in May, while receipts of foreign ore advanced to 7303 tons from 6037 tons in May.

Receipts of lead in scrap declined to 2866 tons in June from 4150 tons in May. Total receipts of lead in scrap during the first six months of this year amounted to 21,930 tons, off sharply from the 43,442 tons reported for the like period of last year.

Zinc—Following the recent advance in slab zinc prices, a leading zinc roller increased his prices $3 per 100 pounds to the basis of 20.00c a pound for sheet zinc and 19.00c a pound for strip zinc. Another producer quoted 19.50c and 18.25c, respectively, on these products.

The advance in zinc prices has not altered the situation in the market so far as demand and supply are concerned. Limited offerings were quickly taken by consumers and the market was still considered tight.

Tin—No change was noted in the tin market last week, prices holding at $1.03, New York. An interesting development was the report from Bolivia that Banco Minero is studying plans for the construction of a plant for production of high grade tin concentrates.

Aluminum—Production of primary aluminum totaled 55,450 short tons in May, an increase of 4 per cent over the 53,277 tons produced in April, and a new postwar record, according to the Bureau of Mines. Power delivery to reduction plants was sufficient to permit a high level of operation throughout the 31-day month. Shipments and use of pig aluminum were again lower than output, and stocks at the reduction plants increased for the second successive month. The decline in shipments and use, however, was not indicative of demand for aluminum, which continued to be strong. Prices of secondary aluminum ingot advanced by as much as two cents a pound during the month, and those of most scrap items rose one cent a pound.

Shipments in June of aluminum wrought products increased to 142 million pounds, a rise of 6 per cent over the 133 million pounds shipped in May, according to the Bureau of the Census. However, it should be pointed out that there were a greater number of working days in June. The June, 1948, shipments were 54 per cent higher than those for the same month in 1947 when only 92 million pounds were shipped. The June shipments brought the total for the first 6 months of 1948 to 849 million pounds, considerably ahead of the 676 million pounds shipped during the first half of 1947.

The increase in the current month's shipments was accounted for principally by shipments of plate, sheet, and strip, which rose to 107 million pounds in June from the 102 million pounds shipped in May. The remainder of the June shipments consisted of 16.4 million pounds of rolled structural shapes, rod, bar, and wire; 16.9 million pounds of extruded shapes, tube blooms and tubing; and 1.7 million pounds of powder, flake, and paste.

Metal Price Averages For July

(Cents per pound)

Electrolytic Copper, del. Conn.	21.574
Lead, St. Louis	17.621
Prime Western Zinc, E. St. Louis	12.444
Straits Tin, New York	103.000
Primary Aluminum Ingots, del.	15.500
Antimony, f.o.b. Laredo, Tex.	35.000
Nickel, f.o.b. refinery	35.833
Silver, New York	74.625

Canadian Lead and Zinc Rise

Montreal—Consolidated Mining & Smelting Co. of Canada Ltd., announced its prices for lead and zinc have been increased 2 and 3 cents a pound, respectively, effective Aug. 5. New selling price for lead will be $18.75 per 100 pounds delivered, and for prime western zinc $14.75 delivered. All other grades of zinc have been increased the same amount. This action follows similar increases announced recently by U. S. producers.

Magnesium Product Sales Rise

Washington—Shipments of magnesium wrought products during June totaled 526 thousand pounds, an increase of 17 per cent over the 448 thousand pounds shipped in May, according to the Bureau of the Census. The June shipments were larger than for any month since March, 1947. Although the June shipments were substantially ahead of the 290 thousand pounds shipped in June, 1947, the shipments during the first 6 months of 1948 at 2677 thousand pounds were still 16 per cent below the 3199 thousand pounds shipped in the first half of 1947.

The above figures do not include extruded sheet stock, extruded sticks, and powder. Shipments of these products have not constituted a significant portion of the total magnesium picture since September, 1945.

Metallurgical Coke . . .

Washington — Total production of coke in 1947 increased 26 per cent over the previous year, according to the Bureau of Mines. Oven coke output increased 24 per cent while that of beehive coke increased 46 per cent. The 26 per cent increase compares favorably with the 30 per cent rise in output of pig iron and is substantially greater than the improvement in industry generally, which was only 10 per cent.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 21.50-23.50c, Conn. Valley; Lake, 21.62½ Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 22.00c; 88-10-2 (No. 215) 31.00c; 80-10-10 (No. 305) 27.25c; No. 1 yellow (No. 405) 17.50c.

Zinc: Prime western 15.00c, brass special 15.25c, intermediate 15.50c, East St. Louis; high grade 16.00c, delivered.

Lead: Common 19.30-19.35c chemical and corroding 19.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 15.00-16.00c, pigs 13.50-15.00c; metallurgical 94% min. nom. 14.50c. Base prices for 10,000 lb and over, fob shipping point, freight allowed.

Secondary Aluminum: Piston alloy (No. 122 type) 24.00-24.75c; No. 12 foundry alloy (No. 2 grade) 23.50-24.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 25.25-25.75c; grade 2, 24.50-25.00c; grade 3, 24.00-24.75c; grade 4, 23.50-24.25c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, fob Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 35.00c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 35.50c, fob Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; shot nom.; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $75-$77 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $20.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $1.90, del.; special or patented shapes, Nom.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 74.62½c per ounce.

Platinum: $93-$96 per ounce.

Palladium: $24 per troy ounce.

Iridium: $110-$120 per troy ounce.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, fob mill)

Sheet: Copper 35.18-37.18; yellow brass 31.41-33.75; commercial bronze, 95%, 35.05-37.11; 90%, 34.52-36.63; red brass, 85% 33-48-35.64; 80% 32.95-35.16; best quality 32.34-34.63; nickel silver, 18%, 43.42-46.41; phosphobronze, grade A, 5%, 54.15-56.05.

Rods: Copper, hot rolled 31.28-33.28; cold drawn 32.28-34.28; yellow brass, free cutting, 25.94-33.44; commercial bronze, 95% 34.74-36.80; 90% 34.21-36.32; red brass, 85% 33.17-35.33 80% 32.64-34.85.

Seamless Tubing: Copper 35.22-37.22; yellow brass 34.42-36.76; commercial branze 90% 37.18-39.29; red brass 85% 36.39-38.55, 80% 35.86-38.07.

Wire: Yellow brass 31.70-34.04; commercial bronze, 95% 35.34-37.40; 90% 34-81-36.92; red brass, 85% 33.77-35.93, 80% 33.24-35.24; best quality brass 32.63-34.92.

ALUMINUM

(Revised price schedule pending; effective June 28)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	24.0	...	...
0.135-0.126	12-48	24.5	...	...
0.125-0.096	12-48	24.5	23.1	26.3
0.095-0.077	12-48	25.0	23.2	26.5
0.076-0.061	12-48	25.5	23.4	26.7
0.060-0.048	12-48	25.7	23.6	27.0
0.047-0.038	12-48	26.1	23.8	27.3
0.037-0.030	12-48	26.4	24.1	27.7
0.029-0.024	12-48	26.8	24.4	28.1
0.023-0.019	12-36	27.4	24.8	28.6
0.018-0.017	12-36	27.9	25.3	29.3
0.016-0.015	12-36	28.6	25.9	30.1
0.014	12-24	29.4	26.6	31.1
0.013-0.012	12.24	30.2	27.3	32.0
0.011	12-24	31.1	28.1	33.1
0.010-0.0095	12-24	32.1	29.0	34.3
0.009-0.0085	12-20	33.2	30.0	35.7
0.008-0.0075	12-20	34.4	31.1	37.1
0.007	12-18	35.7	32.3	38.8
0.006	12-18	37.0	33.5	42.6

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T	17S-T	—Hexagonal— R317-T	17S-T
0.125	45.0	44.0	...	...
0.156-0.203	38.5	37.5	...	...
0.219-0.313	35.5	34.5	...	...
0.344	34.0	33.0	...	...
0.375	33.0	32.0	42.5	40.0
0.406	33.0	32.0	...	...
0.438	33.0	32.0	42.5	40.0
0.469	33.0	32.0	...	...
0.500	33.0	32.0	42.5	40.0
0.531	33.0	32.0	...	...
0.563	33.0	32.0	40.5	38.0
0.594	33.0	32.0	...	...
0.625	33.0	32.0	40.5	38.0
0.656	33.0	32.0	...	...
0.688	33.0	32.0	40.5	38.0
0.750-1.000	32.0	31.0	37.0	35.5
1.063	32.0	31.0	35.5	34.0
1.125-1.500	31.0	30.0	35.5	34.0
1.563	31.0	30.0	...	...
1.625	30.0	29.0	34.5	33.0
1.688-2.000	30.0	29.0	...	...
2.125-2.500	29.5	28.5	...	...
2.625-3.375	28.5	27.5	...	...

LEAD

(Prices to jobbers, fob Cleveland, Pittsburgh)

Sheets: Full rolls, 140 sq ft or more, $23.25 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles and segments. Pipe: Full coils, $22.50 per cwt; cut coils, $22.75. Traps and Bends: List price plus 70%.

ZINC

Sheets, 1950-20.00c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 18.25c-19.00c, fob mill, 36,000 lb and over. Plates, not over 12-in., 17.25c; over 12-in., 18.25c.

NICKEL

(Base prices, fob mill.)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, fob mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes,45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb. 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9%, flake, fob Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 31.84c; oval, 31.34c; electrodeposited, 31.09c; cast, 30.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 44.00c, fob Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 16.00c; 1000 to 19,900 lb, 15.00c, fob Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.00c; over 250 lb, 24.00c, fob Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; fob Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 25.00c; 275-lb, or 500-lb bbls. 23.00c, fob Cleveland.

Tin Anodes: Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c, fob Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 37.25c, fob Cleveland; 37.00c, Detroit; 36.00c, fob Philadelphia.

Stannous Sulphate: Less than 2000 lb, in 100 lb kegs, 100.00c, in 400 lb bbl. 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)

Prices in cents per pound for less than 15,000 lb fob shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.625	15.375	14.750
Commercial Bronze			
95%	18.125	17.875	17.375
90%	17.625	17.375	16.875
Red brass			
85%	17.500	17.250	16.750
80%	17.250	17.000	16.500
Best Quality (71-79%)	16.625	16.375	15.875
Muntz Metal	14.750	14.500	14.000
Nickel silver, 10%	17.000	16.750	8.500
Phos. bronze, A	20.750	20.500	19.500
Naval brass	15.250	15.000	14.500
Manganese bronze	15.250	15.000	14.375

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 19.00, No. 2 copper 18.00, light copper 17.00, composition red brass 16.62½, auto radiators 13.62½, heavy yellow brass 12.00, brass pipe, 12.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 19.00, No. 2 copper 18.00, light copper, 17.00, refinery brass (60% copper), per dry copper content 17.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 17.00-17.25, No. 2 16.00-16.25, light copper 15.00-15.25, No. 1 composition red brass 13.25-13.50, No. 1 composition turnings 12.75-13.00, mixed brass turnings 7.50-7.75, new brass clippings 13.00-13.50, No. 1 brass rod turnings 10.00-10.50, light brass 6.75-7.25, heavy yellow brass 9.25-9.50, new brass rod ends 10.50-11.00, auto radiators, unsweated 10.50-11.00, cocks and faucets 10.25-10.50, brass pipe 10.25-10.50.

Lead: Heavy 16.00-16.50, battery plates 10.50-11.00, linotype and sterotype 18.00-18.50, electrotype 16.50-17.00, mixed bobbitt 15.75-16.25, solder joints, 19.75-20.25.

Zinc: Old zinc 7.75-8.25, new die cast scrap 6.25-6.75, old die cast scrap 4.00-4.50.

Tin: No. 1 pewter 65.00-67.00, block tin pipe 83.00-84.00, No. 1 babbitt 51.00-54.00, siphon tops 50.00-52.00.

Aluminum: Clippings 2S 12.50-13.00, old sheets 11.00-11.50, crankcases 11.00-11.50, borings and turnings 5.50-6.00, pistons, free of struts, 11.00-11.50.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
July Avg.	21.574	17.621	12.444	103.00	15.500	35.000	35.833	74.625
July 30-31	21.50-23.50	19.30-19.350	15.000	103.00	15.00-16.000	35.000	40.000	74.625
Aug. 2-5	21.50-23.50	19.30-19.350	15.000	103.00	15.00-16.000	35.000	40.000	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$42.50-43.00*
No. 2 Heavy Melt. Steel	42.50-43.00*
No. 1 Busheling	42.50-43.00*
Nos. 1, 2 & 3 Bundles	42.50-43.00
Machine Shop Turnings	37.50-38.00
Mixed Borings, Turnings	38.00-38.50
Short Shovel Turnings	39.50-40.00
Cast Iron Borings	38.50-39.00
Bar Crops and Plate	49.00-49.50
Low Phos. Steel	49.00-49.50
Heavy Turnings	**39.50-40.00**

Cast Iron Grades

No. 1 Cupola	64.00-65.00
Machinery Cast	72.00-73.00
Charging Box Cast	59.00-60.00
Heavy Breakable Cast	57.00-58.00
Malleable	**69.00-70.00**
Brake Shoe	**55.50-56.00**
Clean Auto Cast	**58.00-59.00**

Railroad Scrap

No. 1 R.R. Heavy Melt.	44.50-45.00
R.R. Malleable	**75.00-80.00**
Axles	55.00-56.00
Rails, Rerolling	58.00-59.00
Rails, Random Lengths	**54.00-56.00**
Rails, 3 ft and under	61.50-62.50
Rails, 18 in. and under	**62.50-63.50**
Railroad Specialties	57.50-58.00
Uncut Tires	54.50-55.00
Angles, Splice Bars	**53.00-54.00**

* Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$42.00-42.50*
No. 2 Heavy Melt. Steel	42.00-42.50*
No. 1 Busheling	42.00-42.50*
Nos. 1 & 2 Bundles	42.00-42.50*
Machine Shop Turnings	37.00-37.50
Mixed Borings, Turnings	36.50-38.50
Short Shovel Turnings	38.00-38.50
Cast Iron Borings	38.00-38.50
Bar Crops and Plate	47.00-47.50
Punchings & Plate Scrap	47.00-47.50
Heavy Turnings	42.00-43.00
Alloy Free Turnings	40.00-41.00
Cut Structurals	48.50-51.50

Cast Iron Grades

No. 1 Cupola	69.00-71.00
Charging Box Cast	58.00-60.00
Stove Plate	58.00-60.00
Heavy Breakable Cast	54.00-56.00
Unstripped Motor Blocks	58.00-60.00
Malleable	73.00-75.00
Brake Shoes	52.00-53.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	58.00-60.00
Burnt Cast	56.00-57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00*
R.R. Malleable	73.00-75.00
Rails, Rerolling	57.00-58.00
Rails, Random Lengths	56.00-57.00
Rails, 3 ft and under	60.00-61.00
Cast Steel	56.00-58.00
Railroad Specialties	53.00-55.00
Uncut Tires	51.00-53.00
Angles, Splice Bars	57.00-58.00

* Plus applicable freight springboard.

VALLEY

No. 1 Heavy Melt. Steel	$42.50-43.00*
No. 2 Heavy Melt. Steel	42.50-43.00
No. 1 Bundles	42.50-43.00
Machine Shop Turnings	37.00-39.00
Short Shovel Turnings	39.00-39.50
Cast Iron Borings	38.50-39.00
Low Phos.	48.50-50.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00*

* Plus applicable freight springboard.

MANSFIELD

Machine Shop Turnings	$37.50-38.00
Short Shovel Turnings	39.50-40.00

CINCINNATI

No. 1 Heavy Melt. Steel	$42.00
No. 2 Heavy Melt. Steel	42.00
No. 1 Busheling	42.00
Nos. 1 & 2 Bundles	42.00
Machine Shop Turnings	36.00
Mixed Borings, Turnings	36.00
Short Shovel Turnings	38.00
Cast Iron Borings	37.00

Cast Iron Grades

No. 1 Cupola Cast	57.00
Charging Box Cast	45.00
Heavy Breakable Cast	56.00
Stove Plate	50.00
Unstripped Motor Blocks	50.00
Brake Shoes	48.00
Clean Auto Cast	57.00
Drop Broken Cast	65.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00
R.R. Malleable	70.00
Rails, Rerolling	55.00
Rails, Random Lengths	54.00
Rails, 18 in. and under	61.00

DETROIT

(Brokers' buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$37.50-38.00
No. 1 Busheling	37.50-38.00
Nos. 1 & 2 Bundles	37.50-38.00
No. 3 Bundles	37.50-38.00
Machine Shop Turning	31.50-32.00
Mixed Borings, Turnings	31.50-32.00
Short Shovel Turnings	32.50-33.00
Cast Iron Borings	32.50-33.00
Punchings & Plate Scrap	42.50-43.00

Cast Iron Grades

No. 1 Cupola Cast	53.00-58.00
Heavy Breakable Cast	47.00-52.00
Clean Auto Cast	53.00-58.00

BUFFALO

No. 1 Heavy Melt. Steel	$45.50-47.00
No. 2 Heavy Melt. Steel	41.75-42.25
No. 1 Busheling	41.75-42.25
No. 1 & 2 Bundles	41.75-42.25
Machine Shop Turnings	36.75-37.25
Mixed Borings, Turnings	36.75-37.25
Cast Iron Borings	37.75-38.25
Short Shovel Turnings	38.75-39.25
Low Phos.	44.75-46.00

Cast Iron Grades

No. 1 Cupola	60.00-65.00
Mixed Cupola	55.00-60.00
Heavy Breakable Cast	**55.00-57.00**
Malleable	70.00-75.00
Clean Auto Cast	**62.00-64.00**

Railroad Scrap

Rails, 3 ft. and under	**60.00-61.00**
Railroad Specialties	**51.00-53.00**

PHILADELPHIA

No. 1 Heavy Melt. Steel	$45.00-46.00
No. 2 Heavy Melt. Steel	41.50
No. 1 Busheling	41.50
Nos. 1 & 2 Bundles	41.50
No. 3 Bundles	39.50
Machine Shop Turnings	37.50
Mixed Borings, Turnings	37.50
Short Shovel Turnings	38.50
Bar Crop and Plate	50.00-51.00
Punchings & Plate Scrap	50.00-51.00
Cut Structurals	48.50-49.00
Elec. Furnace Bundles	46.00-47.00
Heavy Turnings	44.50-45.00
No. 1 Chemical Borings	**42.00-43.00**

Cast Iron Grades

No. 1 Cupola Cast	**63.00-65.00**
No. 1 Machinery Cast	**67.00-68.00**
Charging Box Cast	62.00-63.00
Heavy Breakable Cast	62.00-63.00
Unstripped Motor Blocks	59.50
Malleable	76.00-78.00
Clean Auto Cast	64.00-65.00
No. 1 Wheels	68.00-70.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$39.00
No. 2 Heavy Melt. Steel	39.00
No. 1 Busheling	37.00
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	35.00
Machine Shop Turnings	31.00-31.50
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings	33.00-33.50
Punchings & Plate Scrap	42.00-42.50
Cut Structurals	42.00-42.50
Elec. Furnace Bundles	42.00-42.50

Cast Iron Grades

No. 1 Cupola Cast	57.00-58.00
Charging Box Cast	**56.00-58.00**
Heavy Breakable	**56.00-58.00**
Unstripped Motor Blocks	**52.50-53.50**
Malleable	**68.00-69.00**

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$ 37.90
No. 2 Heavy Melt. Steel	34.40-35.40
No. 1 Bundles	37.50
No. 1 Busheling	34.40
Machine Shop Turnings	29.40
Mixed Borings, Turnings	29.40
Short Shovel Turnings	31.40
Bar Crops and Plate	39.90
Punchings & Plate Scrap	39.90
Chemical Borings	33.50

Cast Iron Grades

No. 1 Cupola Cast	60.00-64.00
Heavy Breakable Cast	55.00
Stove Plate	52.00-54.00
Unstripped Motor Blocks	45.00-46.00
Clean Auto Cast	53.00-55.00

CHICAGO

No. 1 Heavy Melt. Steel	$41.50-42.00
No. 2 Heavy Melt. Steel	41.50-42.00
No. 1 Bundles	41.50-42.00
No. 2 Bundles	41.50-42.00
No. 3 Bundles	39.50-40.00
Machine Shop Turnings	36.50-37.00
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings	39.50-40.00
Cast Iron Borings	39.00-39.50
Bar Crops and Plate	47.00-48.00
Punchings	48.00-49.00
Elec. Furnace Bundles	42.50-43.00
Heavy Turnings	41.00-41.50
Cut Structurals	46.50-47.00

Cast Iron Grades

No. 1 Cupola Cast	69.00-71.00
Clean Auto Cast	69.00-71.00
No. 1 Wheels	62.00-63.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	47.00-48.00
Malleable	79.00-80.00
Rails, Rerolling	63.00-63.50
Rails, Random Lengths	55.00-56.00
Rails, 3 ft and under	59.00-60.00
Rails, 18 in. and under	60.00-61.00
Railroad Specialties	56.00-57.00
Angles, Splice Bars	55.00-56.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$42.50-43.50
No. 2 Heavy Melt. Steel	40.00-41.00
Machine Shop Turnings	**32.50-33.50**
Short Shovel Turnings	**34.50-35.50**

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	65.00-67.00
Mixed Cast	56.00-58.00
Heavy Breakable Cast	59.00-60.00
Brake Shoes	58.00-59.00
Clean Auto Cast	65.00-67.00
Burnt Cast	59.00-60.00

Railroad Scrap

R.R. Malleable	69.00-70.00
Rails, Rerolling	57.00-60.00
Rails, Random Lengths	50.00-51.00
Rails, 3 ft and under	58.00-60.00
Uncut Tires	49.00-50.00
Angles, Splice Bars	50.00-52.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	**$37.50**
No. 2 Heavy Melt. Steel	**37.50**
No. 1 Busheling	**37.50**
Nos. 1 & 2 Bundles	**37.00**
No. 3 Bundles	**35.00**
Long Turnings	**24.50**
Short Shovel Turnings	**26.00-27.00**
Cast Iron Borings	**25.00**
Bar Crops and Plate	40.00
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	33.00
Stove Plate	60.00-62.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	**38.00**
R.R. Malleable	nom.
Axles, Steel	**50.00**
Rails, Rerolling	53.00-55.00
Rails, Random Lengths	45.00-48.00
Rails, 3 ft and under	53.00-55.00
Angles and Splice Bars	52.00-53.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*27.50
No. 2 Heavy Melt Steel	*27.50
No. 1 Busheling	*27.50
Nos. 1 & 2 Bundles	*27.50
No. 3 Bundles	*24.50
Machine Shop Turnings	*18.00
Bar Crops and Plate	*27.50
Cast Steel	*27.50
Alloy Free Turnings	*18.00
Cut Structurals	*27.50

Railroad Scrap

No. 1 Heavy Melting	*28.50
Axles	*34.00
Rails, Random Lengths	*29.00

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	**$26.00**
No. 2 Heavy Melt. Steel	**26.00**
No. 1 Busheling	**26.00**
Nos. 1 & 2 Bundles	**22.00-23.00**
No. 3 Bundles	**22.00-23.00**
Machine Shop Turnings	**19.00-21.00**
Mixed Borings, Turnings	**19.00-21.00**
Punchings & Plate Scrap	**26.00-28.00**
Cut Structurals	**26.00-28.00**

Cast Iron Grades

No. 1 Cupola Cast	40.00
Heavy Breakable Cast	35.00
Stove Plate	30.00
Unstripped Motor Blocks	32.50
Malleable	40.00
Brake Shoes	35.00
Clean Auto Cast	40.00
No. 1 Wheels	35.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	30.00
Rails, Random Lengths	21.50
Angles and Splice Bars	23.00

LOS ANGELES

No. 1 Heavy Melt. Steel	**$25.00**
No. 2 Heavy Melt. Steel	**25.00**
Nos. 1 & 2 Bundles	**25.00**
Machine Shop Turnings	**16.00**
Mixed Borings, Turnings	**15.50-16.00**
Punchings & Plate Scrap	**28.00**
Elec. Furnace Bundles.	**28.00**

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

HAMILTON, ONT.

(Ceiling prices, delivered)

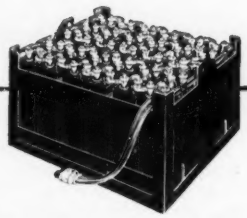
Heavy Melt.	$22.00
No. 1 Bundles	22.00
Mechanical Bundles	20.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	28.00
Rails, Rerolling	26.00
Bushelings	17.00
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	42.00-48.00
No. 2 Cast	35.00-37.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.

These Battery Trucks MAKE Money!



In Industrial Trucks,* EDISON *Nickel-Iron-Alkaline Batteries Give You These Important Advantages

They are **durable mechanically;** grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel.

They can be **charged rapidly;** gassing cannot dislodge the active materials.

They **withstand temperature extremes;** are free from freezing hazard; are easily ventilated for rapid cooling.

They are **foolproof electrically;** are not injured by short circuiting, reverse charging or similar accidents.

They can **stand idle indefinitely** without injury. Merely discharge, shortcircuit, and store in a clean, dry place.

They are **simple and easy to maintain.**

SURE, we put in our battery industrial trucks to economize on operating costs—and they've done that . . . reduced damage and injuries, eliminated demurrage, freed hands for other work. And by tiering stock to the ceiling, they've saved us the expense of building two new storage bays. But more important, they've given us new earning power, increasing our overall plant productivity nearly 25 per cent without a single foot of new floor space.

These battery trucks can keep the pace 24 hours a day every day, and their power characteristics can't be beat: instant starting; quiet operation; no fumes; no power used during stops. And remember, each of their electric motors has only one basic moving part—that means trouble-free operation.

Of course, we've standardized on EDISON Nickel-Iron-Alkaline Batteries for powering them. EDISON has been the most rugged, dependable and long-lasting battery on the market for the past half-century . . . the kind we can bank on to keep our material-handling system—*and our record-breaking production schedule*—right up to snuff!

EDISON

Nickel • Iron • Alkaline

STORAGE BATTERIES

EDISON STORAGE BATTERY DIVISION OF THOMAS A. EDISON, INCORPORATED
West Orange, N. J. In Canada: International Equipment Company, Ltd., Montreal and Toronto

Sheets, Strip . . .

Stainless sheet and strip prices move higher. J. & L. revises extra cards

Sheet Prices, Page 128

Pittsburgh—Jones & Laughlin Steel Corp. has issued new extra cards dated Aug. 1, 1948, on hot and cold-rolled sheets and strip. Major change for cold-rolled sheets involves grade classifications. Any cold-rolled sheet under 24 inches wide is now classified as cold-rolled strip. Formerly, anything under 12 inches wide was so classified; anything from 12 to 23 15/16 inches wide fell into the cold-rolled strip classification only if the customer specified special temper, edge or finish. Stretcher, leveled, standard or flatness extras were revised as follows: 22 gage and heavier, not resquared, increased from 25 cents to 50 cents; 23 gage and lighter, not resquared, 50 to 75 cents. Resquaring side and end, and/or sides and ends, add 10 per cent, instead of 5 per cent previously, to the price, after all extras have been added to the price basis, except extras applying to packaging or marketing.

Wheeling Steel Corp. has increased electrical sheet prices and is now quoting the same price level as Carnegie-Illinois Steel Corp. at its Beech Bottom, W. Va., Works.

First price action on stainless was reported last week by Allegheny Ludlum Steel Corp., which raised both base prices and extras for the various grades by 10 per cent. Per pound price will be rounded out to the nearest quarter cent. This is the first general price increase in stainless made by the company in 2½ years. The stainless steel industry is reported to have under consideration a complete revision of its extra schedules. These extras are said to be antiquated under present operating practices. Allegheny Ludlum's stainless steel products are based at Brackenridge, West Leechburg, Pa., Dunkirk, Watervliet, and Buffalo, N. Y.; stainless forging items at Detroit and Los Angeles.

Allegheny Ludlum has raised hot-rolled carbon strip prices $8 a ton to $3.70 per 100-pound base at its West Leechburg plant; cold-rolled strip, $9 a ton to $4.50 per 100 pounds, also at West Leechburg. Previously Allegheny established higher silicon sheet prices at its Brackenridge Works; silicon strip at West Leechburg.

Heat treating extras also were revised upward as follows: For 12 gage and heavier, carbon 0.30 per cent max. or under, the normalizing or box annealing extra is now 45 cents against 25 cents previously. Similarly, normalizing extra for over 0.30 per cent carbon max. was increased 20 cents to 45 cents. Box annealing extras for 12 gage and heavier were increased 20 cents to 45 cents for over 0.30 per cent to 0.60 per cent max. carbon, and 25 cents to 75 cents for over 0.60 per cent carbon max. For 13 gage and lighter these heat treating extras are 60 cents for normalizing or box annealing when carbon is 0.30 per cent max. or under; 70 cents normalizing extra for carbon over 0.30 per cent max. Box annealing extras for these latter gages are 70 cents when the max. carbon specified is over 0.30 per cent to 0.60 per cent; and 90 cents when max. carbon is over 0.60 per cent.

Pittsburgh—Carnegie-Illinois Steel Corp. last week raised prices on stainless steel products 9¼ per cent, effective Aug. 9. The company also revised extras for packing,, size quantity.

Boston—Some consumers of sheets and strip are passing on the price increases in the cost of their finished products. Many, however, have not determined extent of higher costs and are yet to move. Not only has the actual advance in steel to be considered, but also freight changes. The move in making New Haven, Conn., a mill base point for low carbon cold strip probably takes into consideration the new mill being built there by Detroit Steel Corp., due to start rolling this fall.

New York—Upward trend in stainless steel prices, which have been expected for the past two or three weeks, and especially since the recent increase in nickel, is now getting under way, with at least one producer having increased his schedule 10 per cent on both bar prices and extras. Otherwise, the price situation in sheets is settling down a bit.

Consumers are increasingly focusing their attention on the outlook for fourth quarter, now that the time is not far off when leading producers will begin setting up quotas for the last three months of the year. In general, consumers look for quotas to be somewhat reduced in view of the heavier tonnage likely to be diverted to requirements arising under various voluntary allocation programs. Also, those who have been depending to a considerable degree on shipments from inland mills are particularly concerned over the possible effect of the recent shift of the industry to the mill pricing system.

Cincinnati—Sheet mills are under presure for tonnage in spite of any increase in the cost, delivered, through the change to mill pricing. It was apparent that customers with mill connections in this district are not shifting business to closer mills to achieve savings. The reason, of course, is that demand far exceeds supply. Mills are uncertain on future quotas because of the proposed government programs.

Chicago—Scarcity of flat-rolled products, coupled with uncertainty over the size of fourth quarter quotas, has resulted in an increase in gray market activity in this district. Currently offered are hot and cold-rolled pickled sheets at about $340 a ton. Plates are being offered at $220 a ton. No less stringent, however, is pipe which now is being sought by some users in trade for the most wanted sheet gages. One of the district's major producers has not yet opened its books for fourth quarter and is waiting to see what the voluntary allocation programs will require before doing so. Another producer, however, has now opened its books and reports its carryovers on most products will average only about two weeks, the lower carryover tonnage reflecting care in gearing new order acceptance to contemplated schedules rather than a lessening in demand.

Baltimore, Md.—Eastern Stainless Steel Corp., Baltimore, Md., also increased its prices 10 per cent on all stainless steel sheets and plates effective as of Aug. 4. The increase applied to extras as well as mill prices. This increase was attributed to increased payroll and material costs which have occured during the last two and one-half years since the general increase in price.

St. Louis—Sheets steel consumers are pondering the probable effect of the voluntary steel allocation programs. Indications now are that the new program, plus carryover from the old, will take about 10 per cent of this district's production. Rolling of sheets under the new program will not start until October, but consumers who have long had orders on the books face the prospect of having them cut back if they are unable to get their needs certified as essential to the program. Thus, a comparatively few consumers may have to bear the brunt of the entire 10 per cent set-aside. Because of adjustment difficulties in Granite City Steel Co.'s new cold reduction mill, production has been so uncertain sheet allocations have been made on a monthly instead of quarterly basis. Mills are currently having trouble obtaining adequate pig iron since Missouri-Illinois Furnaces cut its output in half for repairs.

Plates . . .

Plate Prices, Page 129

New York—Demand for plates lighter than ⅜-inch continues exceptionally strong, with most producers tying in sales of this material with orders for heavier gage plate, or not selling it at all, except in some cases which fall under a voluntary allotment program. Particular pressure is noted for 3/16 and ¼-inch sizes, with the lighter gage in special demand by oil companies for tank roofs and the like. Some oil companies have been unable to make replacements of tank roofs for several years and their needs for this work are serious.

Ship repairs and ship reconversion work are lighter but new ship construction is steadily creeping up with a result that the overall needs of eastern shipyards are perhaps the heaviest since the end of the war.

Due to typographical error, the Conshohocken, Pa., floor plate price appeared in the New York report last week as being 4.45c, mill. The price should have been 4.55c, mill.

Philadelphia—One district plate mill last week set up quotas for the fourth quarter, with most others expected to take similar action shortly, if not for the entire quarter, at least on a month-to-month basis. Demand continues strong, with no let-up in sight. An advance in stainless of 10 per cent in base prices and extras features the sheet market. Thus, prices on practically all grades of steets have now been adjusted.

Portland, Oreg.,—Additional structural contracts could be accepted if plates were available according to fabricating management here. Plate supply is constantly behind demand. Mill allocations are disappointing and the recent change in pricing has added to the general confusion.

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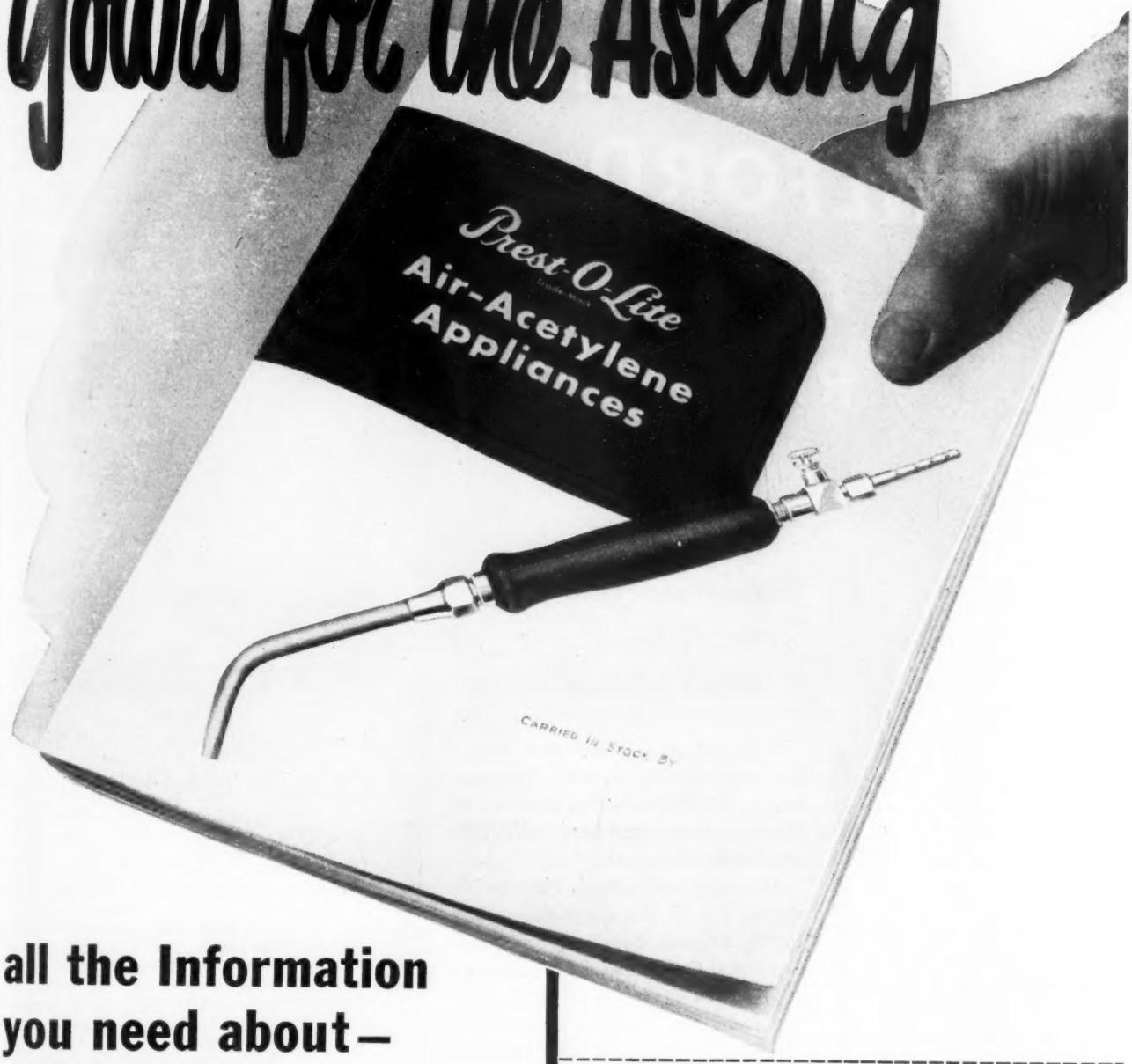

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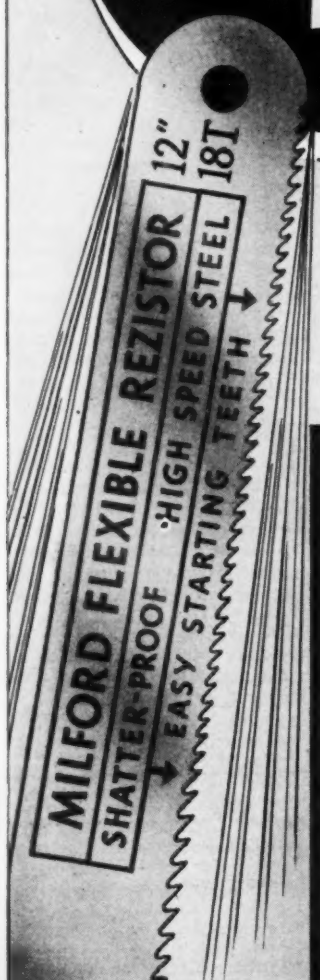

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Steel Bars . . .

Bar Prices, Page 128

Boston — Impact on cold-finished bar distribution, with New England producers on a 4.40-cent mill basis will tend to centralize their markets. All four mills are dependent on other producers for hot bars, although one being integrated may improve this situation. In one case, increased capacity has not been fully utilized because of limited bar supply.

Philadelphia — Prices on merchant bars have steadied, with no revisions announced over the past week. However, one eastern Pennsylvania cold drawer, which has taken no action up to this time, may announce an advance shortly.

Pittsbugh—Most cold-finished alloy bar producers have established a price of $4.65 per 100 pounds at their producing points. However, the price spread on cold-finished alloy bars for mills in the Pittsburgh area ranges between $4.65 to $4.75, the higher price reflecting that quoted by Pittsburgh Steel Co. at its Monessen, Pa., works. Wyckoff Steel Co.'s alloy bar price of $4.65 is based at Chicago and Ambridge, Pa., works; carbon cold-finished priced at $4, Ambridge and Chicago, $4.40 at Newark, N. J., and Putman, Conn.

The price spread on cold-finished carbon bars among Pittsburgh producers ranges between $3.95 and $4.25. The $4.25 price is that quoted by Pittsburgh Steel Co. at Monessen, and the $3.95 price is that of Jones & Laughlin Pittsburgh works. American Steel & Wire Co. and independent carbon cold-finished bar producers are quoting $4 at their respective works.

A. M. Byers Co. is quoting at Economy, Pa., plant the following prices: Iron bars, single refined, $9.50 per 100 pounds; double refined $11; staybolt, $11.30. Lockhart Iron & Steel Co.'s prices for similar products based Pittsburgh works are: $8.60, $11.25 and $12.50, respectively.

Williamsport, Pa. — Sweet's Steel Co., this city, has announced new mill prices of 4.65c on rail steel reinforcing bars, 4.80c on merchant bars (principally rail steel angles), 4.70c on light rail and $123.50 a net ton on fence posts.

St. Louis—Merchant bar and pipe prices in this district are becoming badly confused as the result of diverse quotations being made in St. Louis by outside and local producers. United States Steel Corp., for example, has gone on a mill base for St. Louis, while the area's leading producer has not. Laclede Steel is awaiting its attorneys' opinion on the legal necessity of the change-over. Laclede has announced a price increase, meanwhile, averaging about 12½ per cent on all products. Standard black 2½ and 3 inch buttweld pipe, for example, was raised from $93 a ton to $103; galvanized, from $125 to $135. Merchant bars have gone from $3.40 to $3.85 on a Chicago base. Demand for both products is unrelenting.

Portland — Oregon Steel Rolling Mills Inc. has resumed rolling rounds, flats and some reinforcing bars after losing five weeks, output due to the June floods. An insistent demand for all steel items is reported far beyond the capacity of the plant.

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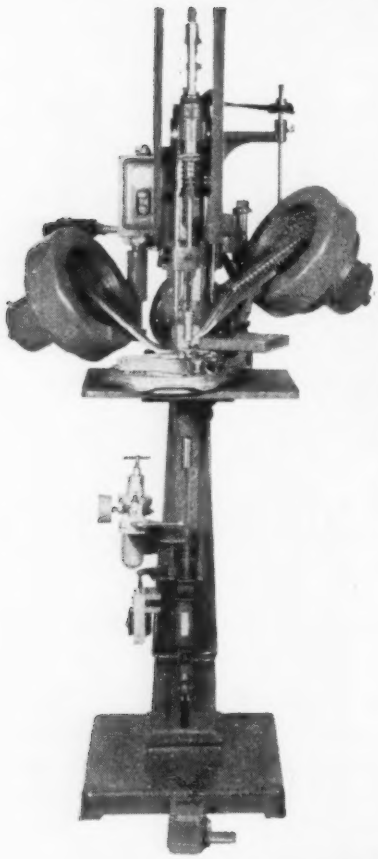

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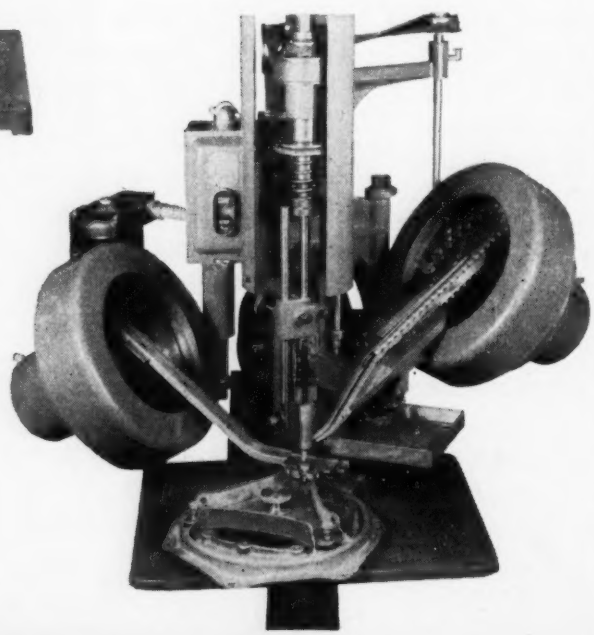
with hopper mounted on each side assembles hex-head cap screws, nut and retainer washer into a clutch pressure plate—an operation that greatly speeds up production from approximately 120 assemblies per hour by the old hand method to 360 to 480 per hour by this modern machine way . . . a happy solution of a problem that confronts all manufacturers of automotive clutch equipment. The nuts are positioned in fixture by means of an air cylinder . . . the washers are placed in fixture by hand. The machine is completely air operated to eliminate operator fatigue.



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Tin Plate . . .

Tin Plate Prices, Page 129

Pittsburgh—All tin plate producers are now pricing their products at the producing point. Jones & Laughlin took that action Aug. 2; Wheeling Steel, July 30, Carnegie-Illinois, July 28; Weirton Steel, July 12. Hot-dipped coke tin plate is now quoted $6.80, mill, for 1.50-pound coating. Granite City Steel Co. is reported to have a price of $7.

With producers going on a mill basis, tin plate consumers will have to pay considerably more as a result of the shifting of freight charges to their shoulders under the mill pricing policy. One effect of this, and high freight rates generally, is reported consideration of Continental Can Co. is giving to erecting a new can factory adjacent to the County Airport and close to the Irvin Works of Carnegie-Illinois Steel Corp. at Dravosburg, Pa.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 128

Boston—Concrete reinforcing bars are frequently the most difficult of building materials to obtain, contractors buying from several suppliers to meet tonnage requirements. Distributors, held to allocations in the aggregate below demand, are reluctant to take on additional tonnage beyond regular customers. Bridges, highway construction and housing developments account for the bulk of inquiry. With the mill price, Sparrows Point and Pittsburgh, equal, at 3.35c, concrete reinforcing bars delivered Boston are 3.91c and 4.02c, respectively.

Wire . . .

Wire Prices, Page 129

Pittsburgh—Prices for various wire products as quoted by producers at their mills in this district are as follows: Bright manufacturing wire, $4.15-$4.50; N. B. spring wire, $5.55-$5.65; high carbon spring wire, $5.20; merchant quality annealed, $4.80-$4.95 and galvanized, $5.25-$5.40; nails, Column 103-126; woven fence, Column 109-113; and barbed wire, Column 123-128. Jones & Laughlin Steel Corp. is now quoting poultry and farm fence as follows: Column 119 for 9 gage; 114 for 11 to 12½ gage; 109 for 14½ gage. This interest also is still quoting nails on a per-100-pound basis of $5.20, comparable to Column 103 quoted by other interests.

Portsmouth Steel Corp. is quoting wire products at Portsmouth, O., works as follows: Wire rods, $4.10; bright manufacturing wire, $4.70; N. B. spring wire, $5.55; nails, Column 117; rope wire, mild plow, $7.50; plow, $7.80; and improved plow, $8.20.

Jones & Laughlin Steel Corp. has advanced galvanizing extras on wire nails $5 a ton to offset 3 cents per pound increase in zinc prices. The new galvanizing extras, on a per 100 pound basis, are as follows: for 15 gage and heavier, $2.75; lighter than 15 gage, $3.25.

Conshohocken, Pa.—Alan Wood Steel Co. has advanced its price for cut nails to $6.75 per 100-pound keg, f.o.b. mill.

Tubular Goods . . .

Tubular Goods Prices, Page 129

Pittsburgh — Some variation in standard butt weld pipe discounts is noted among producers here. For 2-inch butt weld standard pipe, Jones & Laughlin quotes a discount of 49 points for black and 33 for galvanized, against 50 and 34, respectively, reported by National Tube Co. and Spang Chalfant Division of National Supply Co. Jones & Laughlin also is quoting separate discounts for sizes 2½ and 3 inches. The 2½-inch o.d. standard butt weld pipe discount is 50½ for black and 33½ for galvanized; 3 inches, 49½ for black and 33½ galavanized. Similarly Jones & Laughlin has established separate discounts for 2½ and 3-inch o.d. seamless standard pipe of 33½ for black, 16 for galvanized on 2½-inch o.d.; 35 for black and 18½ for galvanized on 3-inch o.d. The company's discounts for 2 and 3½ through 6-inch o.d. also are less than competitors. Jones & Laughlin is quoting discounts of 39½ for black and 23 for galvanized on 2-inch o.d. lapweld standard pipe; 43½ and 27 respectively for 2½ and 3 inches, and 46½ and 30 for 3½ and 4 inches. Spang Chalfant lists the same discounts for 2-inch o.d. standard lapweld, but the 2½ and 3-inch discounts are 42½ for black and 26 for galvanized, and for 3½ through 6 inches, the discounts are 44½ for black and 28 for galvanized. National Tube and Spang Chalfant are quoting the same discounts for black buttweld line pipe. Jones & Laughlin is quoting the same discounts for sizes ½ through 1½-inch, but its discount on 2-inch butt weld is 48 points, and 2½ and 3-inch, 48½ points. This is one point less than quoted by its competitor. National Tube Co. and Spang Chalfant quote the same discount for seamless black line pipe. Jones & Laughlin's discount: 2-inch, 26; 2½-inch, 31½; 3-inch, 34; 3½ through 6, 37½; 8-inch, 40½; 10-inch, 41½; 12-inch, 40½ points.

Babcock & Wilcox Tube Co., Beaver Falls, Pa., has raised hot and cold-drawn seamless and electric weld boiler tube prices 7½ per cent.

Bethlehem, Pa. — Following are Bethlehem Steel Co.'s latest price schedules on pressure and mechanical tubing and pipe:

Schedule A: Seamless carbon, pressure tubes: Increase all quantity extras 9½ per cent, and decrease all quantity deductions 9½ per cent. Schedule A, page 2, paragraph 1, quantity extras now are:

(Pounds or Fleet)	Per cent
40,000 and over	7½
30,000 to 39,999	12½
20,000 to 29,999	17½
10,000 to 19,999	27½
5,000 to 9,999	37½
2,000 to 4,999	52½
Under	72½

Schedule B-2—Seamless alloy pressure tubes: Increase analysis extras 9½ per cent, and decrease analysis deductions 9½ per cent for grades 1 to 33, inclusive.

Schedule B-3—Seamless alloy pressure tubes: Increase analysis extras 9½ per cent, and decrease analysis deductions 9½ per cent.

Schedule J—Seamless alloy mechanical tubes: Increase analysis ex-

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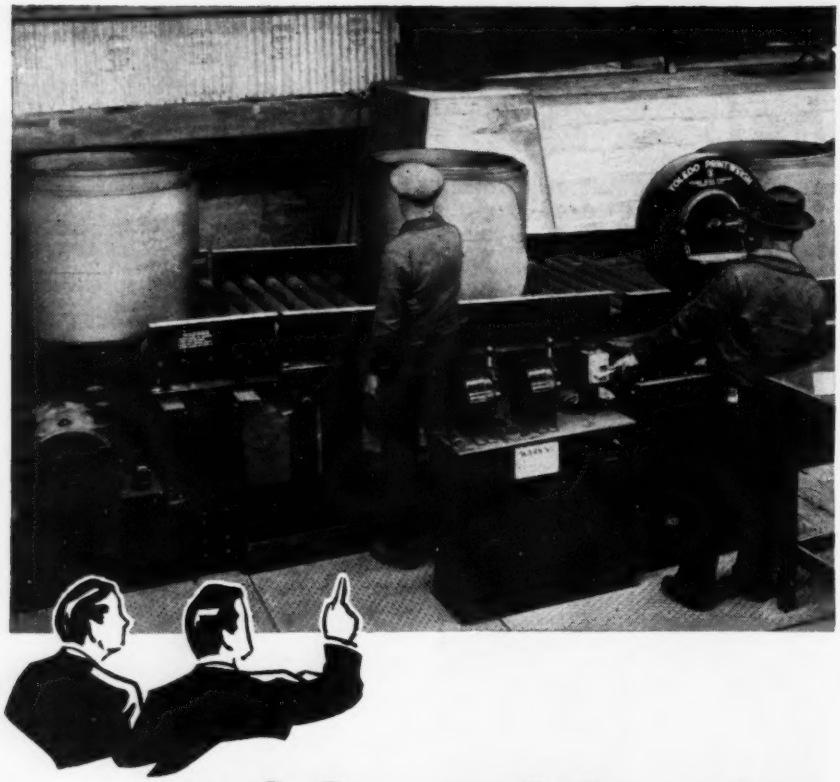

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tras 9½ per cent, and decrease analysis deductions 9½ per cent.

Schedule M—Stainless steel pressure and mechanical tubing: No change at present.

Standard pipe—standard weight—T and C, line pipe T and C, reamed and drifted pipe T and C, extra strong PE, large O.D. pipe and PE and plain end line pipe, sizes ½ to 3 inches, butt weld, and 3½ to 16 inches O.D., lap weld, black and galvanized: Reduce discounts 5 points—higher price.

Lap weld water well casing, T and C, all sizes produced: Increase carlot direct mill shipment list price $20 per net ton.

Standard pipe, standard weight—T and C, reamed and drifted pipe T and C, extra strong PE, large O.D., PE and plain end line pipe list, all sizes 2⅜ to 24 inch O. D. — all grades, black and galvanized: Reduce mill base discounts 5 points —higher price.

Oil country casing and drive pipe, T and C, all sizes and grades: Increase mill base price $10 per net ton.

Oil well tubing, both upset and non-upset, (A) grade H-40 and J-55, all sizes: Increase base prices $11 per net ton. (B) N-80, all sizes: Increase mill base price $15 per net ton.

Drill pipe, all sizes and grades: Increase mill base $8 ner net ton.

Seattle—There is little activity in the cast iron pipe market. Although materials are urgently needed, long term deliveries are holding back important proposed projects. Seattle is planning a major expansion program which will involve important tonnages. Bids will be called soon.

Rails, Cars . . .

Track Material Prices, Page 129

New York—Domestic freight car awards in July amounted to 11,923 against 5873 in the previous month, according to the American Car Institute. Of last month's total 9237 went to car builders and 2686 to railroad shops. Deliveries last month amounted to 8706 and included 3246 hoppers, 3063 box, 753 gondolas, 724 refrigerators and 609 tank cars. Total deliveries in June amounted to 10,381. Backlog, as of Aug. 1, was 125,093 compared with 122,167 a month earlier. Of orders on hand at the beginning of this month, 88,951 were with car builders and 36,142 with railroad shops.

Philadelphia—In addition to a reduction by the Bethlehem Steel Co. on a selected list of items as of July 28 and noted in the Aug. 2 issue of STEEL, this company also reduced light Tee rails, 60 lbs. per yard and under, to 3.55c, Lackawanna, and light Tee rails, 40 lbs. and under, to 3.55c, Johnstown. This represented a $1 a ton decline in each instance. Standard No. 2 rails, over 60 lbs. per yard, were reduced $1 a ton to 3.10c, Steelton, Lackawanna and Sparrows Point. This price was erroneously noted last week as 3.55c.

Philadelphia—Bethlehem Steel Co. has advanced track bolts, untreated, to 8.25c, Bethlehem, Pa., and heat treated to 8.50c, Bethlehem. Bolt spikes have been also advanced to 6.15c, Lebanon.

Structural Shapes . . .

Structural Shape Prices, Page 129

New York—Structural fabricators assert that while some projects are being held up, pending at least a refiguring of costs because of higher mill prices and a change in marketing practice, there is still considerable work being figured, with a reasonably good scattering of orders. One of the larger projects now pending involves 6000 tons for the second section of the municipal ferry terminal at St. George, Staten Island.

Philadelphia—Structural demand is spotty, although district fabricators still have considerable tonnage on their books. In fact, most are practically booked up for the remainder of the year.

Structural awards are featured by steel for additions to two steel mills in Harrisburg, Pa.; 450 tons for Central Iron & Steel Co. and 150 tons for the Harrisburg Steel Corp.

A leading inquiry calls for 1200 tons for a state bridge at Elsmere, Del., with bids Sept. 15; another involves 820 tons for state bridge work in Washington County, Pennsylvania, bids Aug. 20. This latter project will also require 360 tons of reinforcing bars.

Chicago—With the volume of industrial construction estimated at 21 per cent less in June than in the like week a year ago, fabricators are becoming increasingly aware of the change in the industry. Overall demand remains at the same high level, the material released by the slackening of industrial work being taken up by public construction. Bids far above estimates, however, are causing some readvertisement or postponement of these jobs. A U. S. Engineer's western project, now pending, for example, was estimated to cost $35 million and bids were as much as 70 per cent over this estimate. Fabricators in this district, as a hedge against higher freight charges from more distant mills and to cover possible materials and labor cost increases, generally are putting escalator clauses into their contracts.

Portland, Oreg.—Local fabricators report only small contracts for shapes, adding that restricted mill allocations make it impossible for them to bid for larger jobs. The same situation prevails among Seattle shops, several of which are cleaning up backlogs preparatory to the vacation period.

Semifinished Steel . . .

Semifinished Prices, Page 128

Pittsburgh — Relatively uniform prices prevail in semifinished steel items as quoted by leading producers, except open-market transactions on conversion deals. Wire rods are the only semifinished item that is not priced uniformly; American Steel & Wire quoting $3.40 at Rankin Works; Pittsburgh Steel, $4.15 at Monessen; and Portsmouth Steel, $4.10 at Portsmouth. O., works. No steel producer in the Pittsburgh area is currently selling sheet bars.

Conshohocken, Pa.—Alan Wood Steel Co. is now quoting forging billets at $68 per net ton, and rerolling billets at $62, f.o.b. plant.

TAYLOR MADE *by* TAYLOR-WINFIELD

wheel housing seam welded *in 15 seconds* (RESISTANCE)

PRODUCT—Rear wheel housing for a new automobile design.

PROBLEM—To weld housing from stamped halves in one-half the time required with conventional or standard seam welder. Material is 20 ga. cold rolled steel.

TYPE OF WELDER—Special series T-W seam welder with dual, roller anti-friction heads and special air operated pivoting fixture.

PROCEDURE—Halves of wheel housing are placed in fixture. Following sequence is fully automatic. One operation of palm button sets up this cycle...(1) clamps work; (2) moves fixture to welding position; (3) brings welding heads down and heat on, as fixture starts to rotate. On completion of weld, fixture automatically returns to unloading and loading position and unclamps completed assembly.

COMMENT—This special seam welder is designed to fabricate wheel housings of such depth and shape as could not be economically or efficiently deep drawn from one piece to like dimensions.

RESULTS—A production of 150 complete wheel housings per hour with an average welding time of 15 seconds per assembly.

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WARREN, OHIO, U. S. A.

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RESISTANCE WELDERS

Pig Iron . . .

Neville Island producer of pig iron advances prices $4 a ton. Supplies still short

Pig Iron Prices, Page 130

Boston—Several pig iron producers in Buffalo and the East, are essaying means of shipping more tonnage to New England to fill the void resulting from the Mystic breakdown. Several have promised to "do everything possible," but the outlook is not promising in view of the general shortage and the high steel operating rate. Foreign iron is being offered in larger quantities at prices from $83 to near $100 a ton; some foreign iron has been bought, but the price is out of sight for many melters. Mystic price for the fourth quarter will probably be $48.75, making tonnage from that furnace cheapest for most district consumers. Mystic will not operate enough in third quarter to establish a pattern on costs and the rate named for the period taking into consideration second quarter costs will continue. Since this price was established, however, Mystic costs have increased substantially.

New York — In view of the recent suspension of operations of the Mystic furnace, importers here and in New England report a sharp increase in demand for foreign iron, with substantial volume of business resulting. Dutch, Belgian and French iron demand is particularly heavy.

Pig iron importations along the seaboard are heavier. During the 5-week period ending the middle of July, 15,999 tons were reported, comprising 5065 tons of Dutch iron, 4000 tons of Australian, 2906 tons of Norwegian, 2078 tons of German (shipped through Rotterdam), 1650 tons of Belgian and Franch and 300 tons of Swedish; Philadelphia was the major point of entry with 10,970 tons; Boston came next with 2254 tons, to be followed by New York with 1966 tons, Norfolk, Va., with 509 tons and Baltimore with 300 tons.

Philadelphia — Merchant stack at Swedeland, Pa., is expected to resume production early this week after suspension for complete relining. Higher prices at this point were expected to be announced momentarily as this issue went to press. With this furnace going into blast (several days ahead of schedule), the outlook for shipments to district consumers is substantially improved.

Buffalo—Producers here are receiving urgent pleas for pig iron from New England consumers who have been hit by shutdown of Mystic furnace. Allocations for housing material castings are causing some revision in shipping schedules. Little iron is available at this time for distant points. Interest centers in the possibility that a second furnace, which has been idle for years, will be relighted at Colorado Fuel's Wickwire-Spencer steel plant in Tonawanda and will resume production in the next two weeks. There is some talk that the furnace will be operated under a tie-in agreement with another producer.

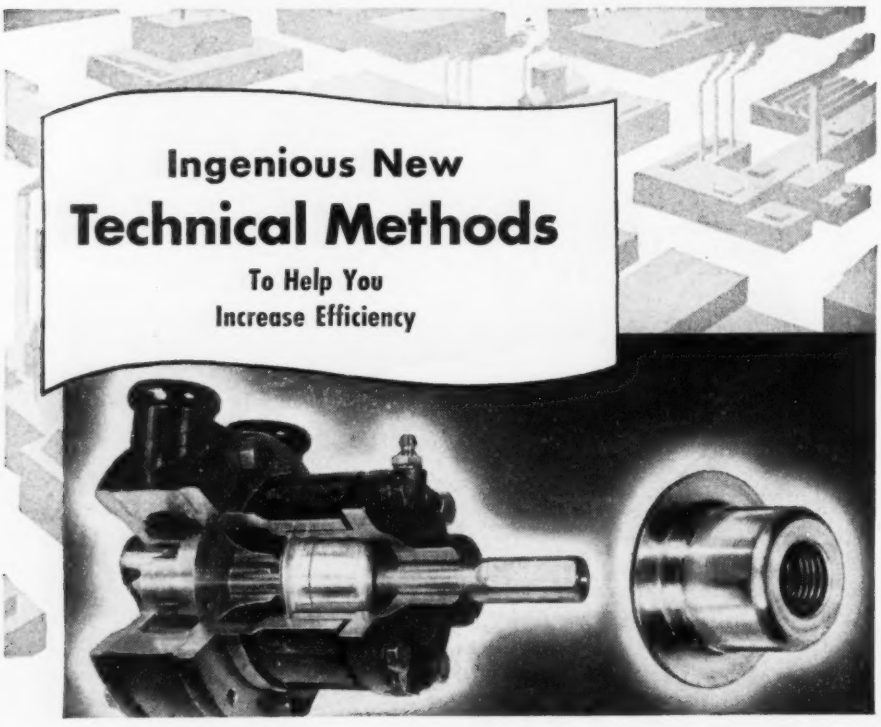
Pittsburgh — Pittsburgh Coke & Chemical Co. Aug. 1 advanced prices $4 a ton across the board on Aug.1, making current quotations, Neville Island furnace, as follows: Basic, $46; No. 2 foundry and malleable, $46.50; and bessemer, $47.

Few foundries in this area have filed requests for pig iron alloted then under the Federal Housing Program. Leading merchant producer here has been notified of the monthly tonnage it is expected to ship under this program but as yet has not been notified what companies are involved.

Cincinnati—Most blast furnace interests failed to ship full allotments of pig iron, for July, to district customers who had hoped to accumulate inventories during the vacation periods. Supplies of foundry iron remain far from adequate, and this lack of iron remains a principal bottleneck in holding down the melt.

Chicago—Inland Steel Co. raised its basic iron price 50 cents to $43.00, effective Aug. 2. Currently all the company's production is in this grade with malleable being nominally quoted at $43.50. At least two leading sellers are still quoting $42.50 on basic and $43 on No. 2 foundry.

Seattle—A record high level of approximately $50.63, delivered to the Seattle-Portland territory, is now being paid. Local foundries have received small allocations of pig under the voluntary agreement, but the supply is inadequate and further shipments are uncertain. Foundries report cast iron scrap is no problem as sufficient is being received to cover current requirements.

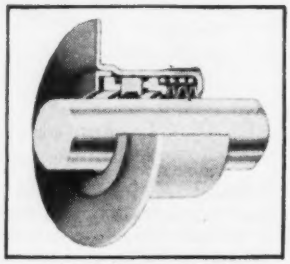


New Cartridge Seal Solves Rotating Shaft Sealing Problems

Stepped-up efficiency in sealing of rotating shafts can now be accomplished with a new Cartridge-type Seal mounted on the shaft.

The Cartridge-type Seal shown above is mounted within a Tuthill Pump. The seal contains all parts in one housing cup and insures positive double sealing. A high grade permanent lubricant is contained within the inside chamber of the housing.

Surfaces within the Cartridge-type Seal are lapped flat to within a few millionths of an inch to insure perfect mating. And, being a complete unit, only one mounting face is necessary. Clamps are eliminated, and adjustments or alignments are not required. Simply push the Cartridge-type Seal onto the shaft, tighten mounting screws and that's all.



Cartridge-type Seal

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Tool Steels . . .

Pittsburgh—Other tool steel producers have followed the lead of Latrobe Electric Steel Co. in raising prices 10 per cent on base and extras for high speed, tool and die, and carbon tool steels. Relatively few companies have to date abandoned their selling practice of meeting competition at such basing point centers as Bethlehem, Dunkirk, Canton, Syracuse, and Pittsburgh. Allegheny-Ludlum Steel Corp. is pricing its tool and die steels at Dunkirk Works; products produced by its forge and casting division are based at Ferndale, Mich. In announcing upward revision of 10 per cent in prices, tool steel producers point out that where the percentage increase results in a fraction other than one-half cent, that fraction is raised upward to the next highest half cent.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 129

Pittsburgh — Most fastener producers advanced prices 15 per cent by close of last week, following similar action taken by producers in other districts. As far as can be determined at this time, uniform prices generally prevail through the industry. Producers have not yet revised selling policy in line with other steel product producers in establishing prices based on producing points. At least one producer here has announced prices f.o.b. Pittsburgh, reserving the right to continue to adjust prices when considered advisable to meet known competition. Industry officials are uncertain as to when or if selling practices will be revised to basis of prices at producing points.

Iron Ore . . .

Iron Ore Prices, Page 130

Cleveland — Consumption of Lake Superior iron ore increased to an average daily rate of about 219,250 tons in June from 214,725 tons in May, although the total declined to 6,577,471 tons from 6,656,498 tons for the respective months, according to the Lake Superior Iron Ore Association, this city. During June, 1947, consumption amounted to 6,499,882 tons. This brought the total for the first six months to 38,341,534 tons compared with 40,230,652 tons for the like 1947 period. Consumption in the United States alone totaled 6,342,447 tons in June compared with 6,411,189 tons in May and 6,261,692 tons in May.

Carnegie-Illinois Steel Corp. blew in a new furnace, No. 12, at South Chicago, Ill., while Pittsburgh Steel Co. blew in a new furnace, No. 3, at Monessen, Pa., making 184 furnaces in the United States on July 1 compared with 182 on June 1 and 183 a year ago. There has been no change in the number in Canada, holding at 10.

Stocks of ore continued to show a satisfactory increase, the total rising to 26,964,608 tons as of July 1 compared with 22,058,158 tons a month ago and 21,745,798 tons a year ago. Stocks at furnaces amounted to 24,307,897 tons as of July 1 compared with 19,885,226 tons on June 1 and 19,593,695 tons on July 1, 1947.

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Scrap . . .

Scrap Prices, Page 134

Boston—Both cast and steel-making grades of scrap are strong with No. 1 heavy melting steel established at $37.90, shipping point. This price, however, is for top grade material with differentials returning between heavy melting grades. Unprepared steel commands around $31. While the price range for cast covers a broader scope than normal, $60 and higher, delivered, is generally paid with breakable around $55. Demand for steel scrap is active and most yards are moving more cast to consumers than they are taking in.

Philadelphia—Turnings have finally responded here to the recent advances in formula prices on open-hearth grades. Machine shop turnings and mixed borings and turnings are now moving at $37.50 delivered and short shovel turnings to $38.50. All other steel grades are unchanged. However, charging box and heavy breakable cast grades have declined about $1 a ton to a spread of $62 to $63, delivered. This situation is explained by the fact that various foundries, unable to obtain an adequate supply of pig iron and finding it impossible to operate fully on scrap alone, had reduced operations to a point where they were no longer pressing for foundry cast scrap, with a result the sellers started moving more for charging box and heavy breakable scrap to the steel mills rather than prepare the scrap for foundry use, and the mills finding themselves eventually in comfortable position on these grades.

Pittsburgh — Increased activity among petroleum, automotive and other interests in buying up limited tonnage of dealer scrap for ingot conversion deals is believed major factor behind stronger price tone of recent weeks. It is contended that some major steel producers not only have been unable to augment inventories in preparation for winter months but in some instances have been forced to dip into stocks to sustain near ingot production. Supply of dealer scrap, excluding reciprocity deals, remains very tight. Higher steel prices have prompted some metalworking companies to seek more money for their scrap. One mill recently made a commitment for substantially over 25,000 tons of scrap from the Phillipines for shipment to Pittsburgh via Baltimore. Open-hearth scrap prices continue strong at $42.50 to $43.00; low phosphorus is higher within range of $49 to $50. Same trend is noted for cast grades, and at least one sale of railroad heavy melting steel is reported at $44.50 to $45, with railroad specialties at $57.50 to $58.

Buffalo—Recently-advanced scrap prices have now been recognized by leading mill consumers. Top mills have placed orders for moderate tonnages at the higher prices. As a result, an increased movement of material is noted from dealers' yards to consumers. It is apparent that some scrap was being held back as dealers waited for the price rise. Dealers point out that the rise was partially discounted in advance as higher prices were being paid in collection channels before consumers' prices were boosted. New contracts were placed on the basis of $42.25 a ton for No. 2 heavy melting. The price hike spread to No. 1 material with new business reported as high as $47 a ton, an increase of about $2.

Some confusion exists over old contracts. Mills generally have adjusted prices in accordance with the prevailing ranges. In some instances, however, consumers are reported insisting on dealers completing deliveries on the old price basis.

Despite the advance there are also reports of some tonnage moving into the Pittsburgh area from this territory at a slight premium. Not too much attention is being paid to these sales at the present time as dealers report the market shows signs of leveling off at prevailing ranges.

Cincinnati—The scrap market has assumed a fairly stable appearance after the recent increase of $2.50 in open hearth grades. The undertone continues strong as brokers and dealers try to bolster melters' stock against the advent of winter. Foundry grades are moving freely at unchanged prices.

Chicago—Although the undertone of the scrap market is strong, mills are adhering to the new formula of $2.50 above the previous prices. At these levels scrap flow is sufficiently large to maintain operations but not to augment inventories substantially. Mills contend that higher prices would have little effect on the amount of scrap available, but the shortage is acute enough to exert a strong pressure on the price level.

St. Louis—Seasonally low scrap shipments added to the already serious shortage have made quotations on melting steel the most chaotic in many months. Rumors of $4 and $5 over the $42.50 to $43.50 list being paid are numerous, but actual transactions at those premiums have not been confirmed. "Black market" prices are flourishing but the operators actually are doing little business. Big consumers have paid no more than $43.50 since the $2.50 rise went into effect July 23. Current inventroies, which average about 60 days, would seem to support the contention. Mills are taking all they can at the list price, however. Besides the harvest season, declining scrap receipts are laid to shippers holding back for anticipated higher prices. Cast demand softened last week due to foundry vacation periods.

Portland Oreg.— According to one local scrap dealer, the recent shortage of steel scrap was created by the larger buyers and was an artificial situation in the face of ample materials. He points to the fact that notwithstanding an alleged shortage, mills were not compelled to curtail operations. This dealer charges manipulation of the market especially in the matter of remote scrap to meet the competition of eastern buyers who are offering $2 above the quoted price of $26. Local suppliers report increased receipts as breaking plants are again in operation following the recent floods. Shipments to Seattle and California points are being forwarded steadily. In Seattle, scrap receipts are satisfactory and inventories are increasing. In view of the general rise of $10 a ton on steel products, except bolts, unts, and a few items not yet set, dealers are insisting on higher prices for scrap.

Warehouse . . .

Most distributors increase their price spread $5 a ton over mill levels

Warehouse Prices, Page 131

Pittsburgh—Most steel distributors have increased their warehouse price spread $5 a ton (the first time since before the war) to offset accumulated increases in operating costs. All interests are pricing their products at the warehouse. Generally speaking, the cartage charge for city delivery is 15 cents per 100 pounds, although some distributors are charging actual cost to destination for city delivery, pending revision of trucking contracts. These charges range from 10 to 20 cents per 100 pounds.

Jones & Laughlin Steel Corp.'s warehouse outlets have discontinued item quantity deductions allowed on shipments of 400 pounds and over. Other distributors here have not yet taken similar action. These quantity deductions now in effect among other distributors are as follows: 400 to 1999, base; less 10 cents for quantities up to 9999; less 20 cents for quantities 10,000 pounds and over. Item quantity extras for shipments 100 to 399 pounds have been increased from 50 cents to $1 and on shipments under 100 pounds, from $1.50 to $2.50 per 100 pounds. Jones & Laughlin also has established a charge of 15 cents for lcl shipments to railroad depot for out of town delivery.

Pittsburgh district warehouse prices range by product as follows: Hot-rolled sheets, $4.85 to $5 per 100 pounds; cold-rolled sheets, $5.75 to $5.85; galvanized sheets, $6.90 to $7.05; hot-rolled strip, $5 to $5.35; cold-rolled strip, $5.95 to $6; hot-rolled bars, $4.90 to $5.10; cold-finished bars, $5.65; hot-rolled alloy, as rolled, $7.65; shapes, $4.90 to $5.15; plates, $5.05 to $5.25; and $6.55 for floor plates. Higher mill galvanized sheet coating extras, reflecting increase in zinc prices, have forced distributors to further raise galvanized sheet prices $10 a ton to levels noted above.

U. S. Steel Supply Co.'s item quantity extras for cold-finished bars are as follows: Base, 1000 pounds and over; 500 to 999 pounds, add 75 cents; 300 to 499 pounds, add $1.50; less than 300 pounds, add $2.50 per 100 pounds. If total order is under 300 pounds, add $4. For each of these weight brackets, Jones & Laughlin has established quantity extras of 25 cents above that announced by U. S. Steel Supply Co.

Joseph T. Ryerson's warehouse price on hot-rolled carbon bars is $5 for rounds, flats, squares 7/8-inch and larger, and bar angles within 2-inch leg minimum. For those bar sizes the company must purchase from Youngstown area ,the price is $5.05 per 100 pounds. These include squares under 7/8-inch, all hexagons and ovals, half ovals, half rounds, bar channels and Tees, and all other bar size angles. U. S. Steel Supply is quoting hot-rolled alloy 4140 series, annealed, at $9.15 per 100 pounds, and cold-finished alloy 4140, $10.55, annealed.

Cincinnati—Steel jobbers here have increased prices in the wake of higher

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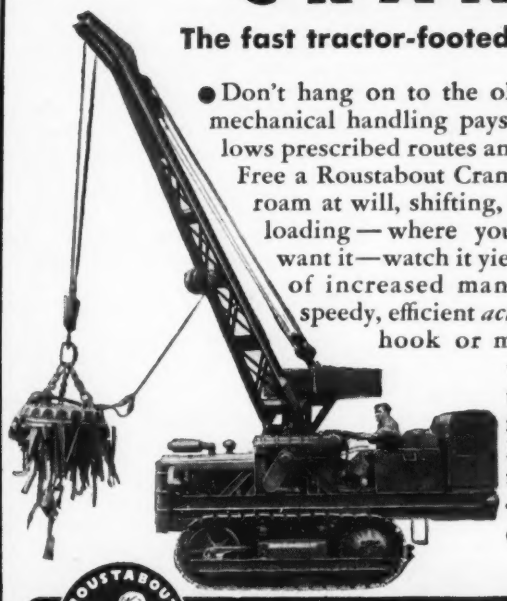

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mill quotations. These warehouse schedules vary widely, the entire price situation is confused. Mill shipments are getting moderately heavier, but scarcity of sheets, plates, and shapes is acute.

Chicago—Most steel distributors in this area have now established their prices at the new levels to reflect increases in mill prices. No immediate resistance to the new warehouse prices is anticipated for the time being, and, as in the case of present mill prices, none probably will be seen unless consumer resistance to higher prices on products made of steel is encountered on a broad front. Since the first of the major warehouses established their new schedules and the others brought their quotations in line with these, the price of zinc and consequently of zinc-coated items advanced, which brought the warehouse price of galvanized sheets (10 ga.) up 10 points to 7.05c, f.o.b. warehouses.

Seattle — The wholesale jobbing trade is in a period of transition while awaiting further information on mill prices, freights and other controlling factors. Meanwhile, some temporary price changes, all upward, have been announced, but the permanent price lists await further developments. The confusion and uncertainity have resulted in a curtailed demand but this is believed temporary. Sheets, plates, shapes, pipe and reinforcing bars continue in acutely short supply. The nail supply is easier.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 130

Washington — Total production of coke in 1947 increased 26 per cent over the previous year, according to the Bureau of Mines. Oven coke output increased 24 per cent while that of beehive coke increased 46 per cent. The 26 per cent increase compares favorably with the 30 per cent rise in output of pig iron and is substantially greater than the improvement in industry generally, which was only 10 per cent.

Production of oven coke averaged 183,331 tons per day in the first quarter of 1947 and, although dropping slightly in the second and third quarters, increased considerably in the last quarter, averaging 189,517 tons per day, the highest rate ever maintained for a corresponding period.

Canada . . .

Toronto, Ont.—Production of iron and steel in Canada for May attained the highest monthly record in history. While there was no change in blast furnace capacity during the month, Algoma Steel Corp. Ltd., Sault Ste. Marie, by a change in process which enables it to charge different materials into furnaces increased its basic open-hearth ingot capacity by 290,000 tons per year, to bring the total rated capacity for open-hearth ingots in Canada to 3,060,000 net tons. During the month, Sorel Industries Ltd., Sorel, Que., went out of business and its electric furnaces, installed during the war, have been dropped from the Dominion Bureau of Statistic capacity listings; thus, electric furnace ingot capacity was reduced by 55,000 tons to 420,000 tons a year. Throughout May 12 of the 14 blast furnaces in Canada were blowing.

Pig iron production for May amounted to 193,305 net tons, an all time high record, and equivalent to 82.9 per cent of rated capacity, which compares with 75.7 per cent for April and 68.7 per cent for May, 1947. May's output included 156,837 tons of basic iron, 21,434 tons of foundry iron and 15,034 tons of malleable iron.

Production of steel ingots and castings in May amounted to 289,567 net tons which was at an average of 90.1 per cent of the increased rated capacity and compares with 90.6 per cent for April.

Sharon Adopts f.o.b. Mill

Sharon, Pa.—Sharon Steel Corp., went f.o.b. Sharon works in late July and announced prices as follows: Hot-rolled strip, 6 inches and under 3.35c, wider than 6 inches, 3.25c, cold-rolled strip, 4.00c; plates, 3.40c; alloy hot-rolled strip, 5.10c, alloy cold-rolled strip, 9.50c.

Alan Wood Plans Strip Mill

ALAN WOOD Steel Co. will reduce its conversion costs and expand its line of finished products with installation of a 30-inch hot strip mill at Conshohocken, Pa., President John T. Whiting announced last week. The mill, costing about $8.9 million,

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2700 tons, boiler house, Indiana and Michigan Electric Co. Lawrenceburg, Ind., to Fort Pitt Bridge Works, Pittsburgh.

670 ton, decking and moving facilities, Texas Co., Westville, N. J., to Bethlehem Steel Co.

600 tons, building, Institute, W. Va., through Carbide & Carbon Chemicals Co., to Bethlehem Steel Co.

600 tons, marginal dyke and ditch, LaGuardia Field, Queens, New York, to American Bridge Co., Pittsburgh.

600 tons, warehouse and bindery, Cuneo Eastern Press Co., Philadelphia, to Bethlehem Steel Co.

451 tons, bridge, cont. 030-2(8), Green county, Wisconsin, for state to Bethlehem Steel Co.

450 tons, plant addition, Curtis Wright Co., Caldwell, N. J., through George A. Fuller Co., to American Bridge Co., Pittsburgh.

370 tons, state highway bridge, Clifton, N. J., through the Franklin Contracting Co., to Bethlehem Steel Co.,

650 tons, theology building, Boston University, Boston, to Bethlehem Steel Co.; Turner Construction Co., Boston, general contractor.

200 tons, state bridges, Hamden, Conn., to Phoenix Bridge Co., Phoenixville, Pa.

200 tons, state bridge, Clinton county, Pennsylvania, to Bethlehem Steel Co.

185 tons, weave shed, Bedford, Va., through Leo F. Caproni, New Haven, Conn., to Virginia Bridge Co., Roanoke, Va.

150 tons, Standard Oil Co., Everett, Mass., to Phoenix Bridge Co., Phoenixville, Pa.

125 tons, state bridge, Washington county, Rhode Island, to American Bridge Co., Pittsburgh.

177 tons, bridge, cont. S 084(1), Racine county, Wisconsin, for state, to Bethlehem Steel Co.

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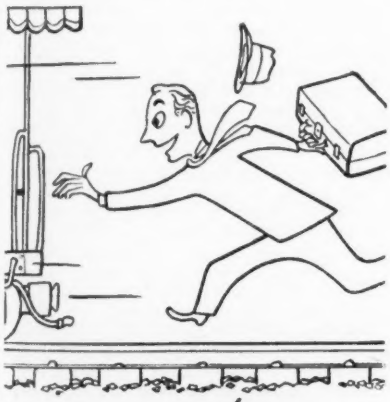

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Sept. 28, 29, 30, Oct. 1, 1948

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150 tons, Associated Lead & Zinc Co. plant, Seattle, to Pacific Car & Foundry Co., Seattle; H. S. Wright Co., Seattle, general contract.

140 tons, state highway bridge, Middletown, Conn., through E. B. McGurk & Co., to the Phoenix Bridge Co., Phoenixville, Pa.

116 tons, bridge, cont. T-06-4, Dunn county, Wisconsin, for state, to Bethlehem Steel Co.

110 tons, grandstand, Fair Grounds, Brockton, Mass., to Phoenix Bridge Co., Phoenixville, Pa.

STRUCTURAL STEEL PENDING

6000 tons, second section, St. George municipal terminal, Staten Island, New York; bids asked.

4545 tons, manufacturing building, Western Electric Co. Inc., Indianapolis.

4500 tons sheet piling, lock and dam; bids Aug. 17 to U. S. Engineer, Morgantown, W. Va.

4000 tons, McNary dam, Oregon state; general contract to G. F. Atkinson Co., Ostrander Construction Co. and J. H. Jones Construction Co., all of Portland, Oreg.; low $21,648,763.

1100 tons, New Jersey Bell Telephone addition, Newark, N. J.; bids asked.

1000 tons, bus garage for the Board of Transportation, Flushing, Queens, New York, bids Aug. 13.

1000 tons, junior high school building, Sterling, Ill.; bids over estimate, rejected.

900 tons, Board of Transportation garage, Flatbush section, Brooklyn, N. Y.; bids asked.

800 tons, School No. 14, Staten Island, New York; bids asked.

700 tons, School No. 115, Queens, New York; bids asked.

400 tons, addition to School No. 2, Queens, New York; bids asked.

270 tons, two municipal recreation centers, Philadelphia; M. & L. Construction Co., that city, low on general contract.

237 tons sheet piling, dam and spillway, Ramsey, Ill., for Illinois State Conservation Dept.; bids in.

200 tons, including plain material, state bridge, Bradford county, Pennsylvania; bids Aug. 13.

185 tons, Washington state bridge, Whatcom county; bids to Olympia, Aug. 6.

Unstated, telephone equipment building, Bremerton, Wash.; H. S. Wright Co., Seattle, general contract.

Unstated, two 290-ton traveling cranes for Hungry Horse power plant; Shaw Box Crane & Hoist division of Manning, Maxwell & Moore Inc., sole bidder.

Unstated, 220-foot steel span, Cowlitz river, Washington state; award by Lewis county commissioners to Anderson Bridge Co., Tacoma; low $158,158.

Unstated, 100-foot T beam span for Walla Walla county, Washington; general contract to Jurgena & Egelkraut, Burlington, Wash.

Unstated tonnage, Board of Transportation bus terminal, Ulmer Park, Brooklyn, N. Y., bids expected to be asked shortly.

REINFORCING BARS . . .

REINFORCING BARS PLACED

730 tons, Evergreen high school, Vancouver, Wash., to Mercer Steel Co., Portland, Oreg.

500 tons, Richwood reservoir, Spokane, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

380 tons, National Biscuit Co. plant, Portland, Oreg., to Mercer Steel Co., Portland, Oreg.

250 tons, Frost Snyder building, Tacoma, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

165 tons, Administration building, Seattle school board, to Bethlehem Pacific Coast Steel Corp., Seattle; J. H. Sellen, general contract.

100 tons, Nugent state bridge, Whatcom county, Washington, to Bethlehem Pacific

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Q. Why ALL-METAL CONSTRUCTION?

A. Higher protection . . . greater fire-resistance . . . longer life with less maintenance. Kinnear's steel-slat curtain features strength *plus flexibility—it absorbs many shocks and blows* that damage other types of doors.

Q. Why KINNEAR STEEL ROLLING DOORS?

A. For half a century, KINNEAR has combined all the above door advantages, providing highest efficiency at lowest cost to industrial and commercial users of every type. Kinnear Rolling Doors are available any size, for old or new buildings, with motor, manual or mechanical operation. Write today for complete information.

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Saving Ways in Doorways
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HEATING FURNACE Repair and Outage Costs Climb

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SEMISILICA BRICKS

Heating furnace roofs, open hearth regenerator roofs, hot blast stoves and other mill furnaces operating continuously enough to cause "first quality" and "super duty" brick to vitrify and spall . . . yet which are shut down frequently enough to cause silica brick to spall . . . need Remmey RM semisilica brick.

REMMEY

RICHARD C. REMMEY SON CO.
Philadelphia 37, Pennsylvania

Coast Steel Corp., Seattle; Northwest Construction Co., Seattle, general contract.

REINFORCING BARS PENDING

1500 tons, Seattle Public Safety building; general contract to Kuney Johnson Co., Seattle; low, $3,354,091.

100 tons, Washington state bridge, Whatcom county; bids to Olympia Aug. 6.

Unstated, first unit McNary dam, Oregon; general contract awarded.

Unstated, 3-story Caldwell Memorial hospital; International Builders, Caldwell, Idaho; low, $558,377.

Unstated, eleven steel and concrete state bridges, Prairie and Dawson counties, Montana; general contract to Northwestern Engineering Co., Rapid City, S. D.; low, $294,223.

Unstated, state concrete bridge, Silver Bow and Jefferson counties, Montana; general contract to Kelly Construction Co., Butte; low, $327,829.

PLATES . . .

PLATES PLACED

2400 tons, penstocks, surge tanks, etc., Tokete power project, Oregon state, for California-Oregon Power Co., to American Pipe & Construction Co., Portland, Oreg.

850 tons, Lewiston Orchards water project, Lewiston, Idaho, 7 gage, 3/16-inch, 30½ to 36½-inch diameter pipe, to Hydraulic Supply Mfg., Co., Seattle; Goodfellow Bros., Wenatchee, Wash., general contract.

600 tons, ¼-inch water pipe for Salem, Oreg., to American Pipe & Construction Co., Portland, Oreg.

150 tons, elevated water tank for U. S. Navy, Spokane, Wash., to American Pipe & Construction Co., Portland, Ore.

PLATES PENDING

4000 tons, steel sheet piling, breakwater at Astoria, Oreg.; Macco Corp., Clearwater, Cal., low to U. S. Engineer, Portland, Oreg. $1,248,325.

Unstated, two 100,000-gallon tanks and one 250,000-gallon tank, with towers; Pittsburgh-Des Moines Steel Co., Pittsburgh, low to U. S. Engineers, Portland, Oreg., for steel construction, $184,685; alternative bids for wood construction; award pending.

PIPE . . .

CAST IRON PIPE PENDING

134 tons, to Seattle and Marine Drive water district, Bremerton, Wash.; H. G. Purcell, Seattle, low for U. S. Pipe & Foundry Co., Burlington, N. J.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Texas & Pacific, 11 diesel-electric locomotives, to Electro-Motive Division, General Motors Corp., LaGrange, Ill; list comprises six 6000-horsepower and four 4500-horsepower freight locomotives and one 4000-horsepower passenger locomotive.

RAILROAD CARS PLACED

Bangor & Aroostook, 100 fifty-ton all-steel, side-discharge pulpwood cars, to Magor Car Corp., Clifton, N. J.

Chesapeake & Ohio, 1000 seventy-ton hopper cars, of all welded construction, to the American Car & Foundry Co., New York.

Seaboard Air Line, 200 seventy-ton covered cement hopper cars, to Greenville Steel Car Co., Greenville, Pa.

RAILROAD CARS PENDING

Chicago, Milwaukee & St. Paul has new tentative program for 4080 cars, comprising 2300 fifty-ton gondolas, 1000 fifty-ton boxcars, 500 fifty-ton flat cars, 200 forty-ton log flats, 30 low side gondolas, and 50 steel cabooses.

Mississippi Central, 200 fifty-ton box cars.

National of Mexico, 1000 fifty-ton and 500 500 forty-ton stock cars.

Virginian, 1000 fifty-five ton hopper cars.

CONSTRUCTION AND ENTERPRISE

ALABAMA

BIRMINGHAM, ALA.—Southern Natural Gas Co. has authorization of Federal Power Commission to construct facilities which will increase its main line delivery capacity at an estimated cost of $3,531,000.

ARKANSAS

HOT SPRINGS, ARK.—The Arkansas Power and Light Co., Pine Bluff, plans the construction of a $9,000,000 addition to its Lake Catherine steam generating plant.

CALIFORNIA

SOUTH GATE, CALIF.—Rheem Mfg. Co. is erecting a $150,000 addition to the plant at 4316 Firestone Blvd.

INDIANA

KOKOMO, IND.—Delco Radio Div. of General Motors Corp. is planning to build an assembly building, costing over $500,000 including equipment.

OHIO

AKRON—Manufacturers Steel Warehouse Corp. has been incorporated by Elsie L. Williams, Kenneth A. Mason and Paul C. Welck, 1910 First National Tower, to manufacture and deal in iron, steel, manganese, lumber and other metals and minerals.

BARBERTON, OHIO—Ohio Brass Co.'s remodeling and expansion program has boosted their productive capacity 25%. Cost of projects both here and at the main plant in Mansfield was $2 million.

CARDINGTON, OHIO—Cardington Machine Works Inc., O. D. Jackson, president, has sold stock to Kenosha Transport Corp. Kenosha, Wis., and will begin to manufacture and assemble auto transport trucks.

CLEVELAND—Lamp Hardware Inc., 1976 E. 66 St., has been formed to manufacture metal lamp parts, switches and related items.

CLEVELAND—Columbia Metal Stamping Co., 11900 Harvard Ave., will expand its plant by constructing a $60,000 factory addition.

CLEVELAND—Hines Flask Co., 3431 W. 130 St., will build an $80,000 addition to its factory.

CLEVELAND—Cleveland Electric Illuminating Co., 75 Public Square, is asking bids for a $100,000 electrical substation to be built at Cedar and Warrensville Center Rds.

CLEVELAND—Lakeland Machine Products Inc., recently formed by Margaret and George McInnes and John O. Brigleb, will move into a new plant being completed on Lakeland Blvd. in Wickliffe.

CLEVELAND—Glidden Co., Dwight P. Joyce, president, Union Commerce Bldg., plans to build a $3,000,000 soy bean extraction plant in Indianapolis, Ind.

CLEVELAND—Wagner-Portmann Mold Co., recently incorporated by Walter Wagner and Milton C. Portmann Jr., 4900 Ridge Rd., will construct an addition to their plant. New equipment and machinery are to be installed, most of which is already on order. The firm makes plastic molds and die casting dies.

CLEVELAND—United Tube Corp., G. W. Wattles Jr., president, 2134 W. 53 St., will move its plant to 3680 E. 91 St., after alterations costing about $12,000 are completed. The firm makes electric welded mechanical tubing.

CLEVELAND—Acope Machine & Mfg. Co., 3825 W. 150 St., has been incorporated by Anton L. Kopanski, owner, as a jobbing machine shop to make metal stampings and screw machine products.

CLEVELAND—Electric Steel Corp, has been chartered through Dan B. Cull Jr., attorney, 602 Union Commerce Bldg., and will establish a sales company here handling steel products and eventually go into the production of steel products.

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—then it's a cinch you'd better change to the dresser with the

"EDUCATED DIAMONDS"

(They stand abuse . . . and *can't* come loose!)

Imbedded in a matrix of super-hard Carboloy Cemented Carbide, these keen-cutting diamond points stand *real abuse* . . . they can't come loose! They hold on "for dear life" throughout their entire period of usefulness.

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by CARBOLOY ®

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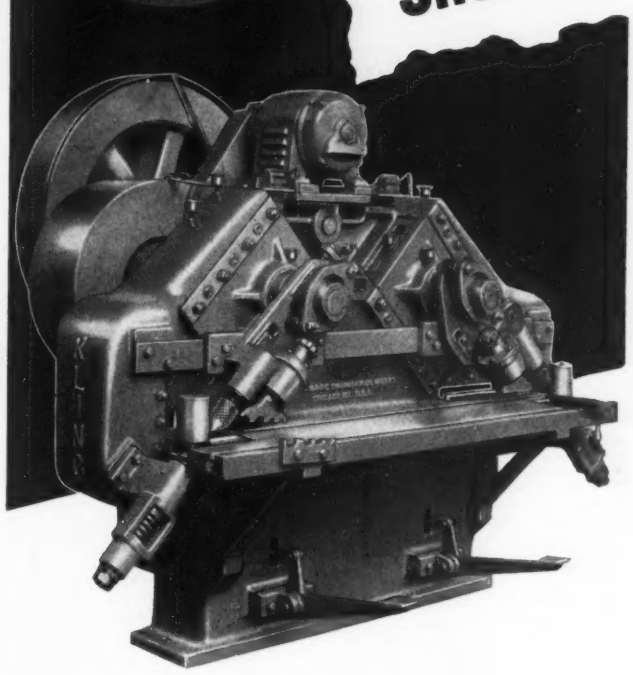

Especially designed for high speed, high production shearing. Will handle flat and round mild steel bars in addition to structural and bar angles. Round bars and bar angles are sheared on the left side, while the right side is used for structural angles and flat bars.

These special shears are equipped with automatic hold downs and "Y" type roller supports, also a removable guide for flat bar shearing. *Recommended for straight shearing only.* Mitreing can be accomplished by removal of holddowns. Available in four sizes.

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Kling BROS. ENGINEERING WORKS

Manufacturers of Rotary, Plate, Bar Shears, Combination Shears, Punches and Copers, Single and Double End Punches, Angle, Beam, Bar and Plate Benders, High Speed Friction Saws.

1328S NORTH KOSTNER AVENUE CHICAGO 51, ILLINOIS

CLEVELAND—Crown Tool Co. has been formed by Emery J. Zahuranec, John Kotis, and others, and is setting up machinery and equipment at 4160 E. 59 St.

CLEVELAND—Nickel Plate Railroad, John W. Davin, president, will undertake improvements in its facilities here and in Conneaut totaling more than $225,000. A $150,000 transfer table and pit, an industrial switching lead, a coal dock and a cinder conveyor will be constructed in Conneaut.

CLEVELAND—Weiser-Hill Mfg. Co. has been incorporated through Aaron A. Wieser, attorney, 1230 Standard Bldg., to manufacture and deal in machinery, appliances, accessories and instruments.

CLEVELAND—Erie Railroad Co., Midland Bldg., will buy equipment for its marine fleet at an estimated cost of $1,800,000, including four steel car floats, ten barges and fifteen lighters.

CLEVELAND—Barth Mfg. Co. will consolidate with Barth Stamping & Machine Co., John J. Barth, president, offices at Denison Ave. & W. 34 St. Facilities for production and assembly will be added to those for the manufacture of tools, dies and special machinery.

COLUMBUS, O.—Sears, Roebuck & Co. has purchased a 36-acre tract northwest of the main business section for a new mail order plant and department store. Construction work is expected to begin next year.

CONNEAUT, OHIO—Burke Machine Tool Co., manufacturers of milling machines and attachments, and precision bench tools, has been sold to Louis Goldsmith and Associates of Cincinnati.

CUYAHOGA FALLS, OHIO—Prospect Mold & Die Co., 1817 Front St. will be incorporated by William P. Wright Jr., Walter Nagel and John D. Wortman, attorney. The company operates a general machine shop, tool, die and mold business.

GHENT, OHIO—D-S-C Industries Inc., Charles H. Davis, president, has transferred casting operations in making an aluminum automotive piston known as "Nu-Strut" to the plant of Permold Co., Medina. It is expected that D-S-C Industries' machining operations on pistons for the replacement field and such original equipment as they now are manufacturing will shortly be transferred to rented quarters at the Permold plant.

MANSFIELD, OHIO—Hoover Instrument Service Inc. has been organized by Earl L. Hoover, 124 Grover St., John R. Weeks, and George H. Keyser to manufacture and deal in machine tools, engines, equipment and accessories.

MT. VERNON, OHIO—Mount Vernon Farmers Exchange, Robert Grosjean, manager, will construct a $90,000 grain elevator and dryer at the W. Vine St. warehouse, to be completed by November.

NILES, OHIO—Stevens Metal Products Co., Ray Emery, manager, is spending $500,000 on a project which includes installation of new equipment designed to increase production of synthetic linings for steel barrels produced, a new air compressor, new air and gas lines, electrical equipment and an additional railway siding.

WARREN, OHIO — National Aluminum Products Corp., L. L. Daniels, president, Canton, has moved its plant here and has started operations in a new building on N. Park Ave.; general offices at 262 E. Market St. The corporation manufactures aluminum and steel ship-lap siding with a baked enamel surface for houses. Machinery for the plant has been moved here from Cleveland, Canton and Pittsburgh. As soon as contracting arrangements are completed another building will be constructed.

WILLIAMSFIELD, OHIO—Valley Steel & Metal Stamping Co. has been incorporated by Guy B. Walls, Dale E. Hogue and G. Walls, RFD, Williamsfield.

YOUNGSTOWN, OHIO—Gorgie Mfg. Co., 210 Salt Spring Rd. has been formed by Frank J. Gorgie and Edward J. Hura to make lightweight electric ironers designed for travelers. Another company supplies the heating units.

PENNSYLVANIA

ERIE, PA.—Erie Works, General Electric Co., has approved plans for the construction of a refrigerator storage and shipping warehouse conveyor system to store and prepare rehouse, costing $4 million including equipment. The building will be equipped with frigerations for shipment. The installation of three overhead cranes will facilitate handling. Construction of the new building will be under the supervision of the GE Realty Corp.; Frank D. Carey, resident engineer.

TEXAS

LONGVIEW, TEX.—Southwestern Gas & Electric Co., Frank M. Wilkes, president, Shreveport, La., has awarded a $500,000 contract to Austin Building Co., 1400 W. 39th, Austin, for construction of a sub-structure of the Knox Lee Power Plant to be located on Lake Cherokee in Gregg County.

PRICES OF LEADING FERROALLOYS PRODUCTS

(*Concluded from Page* 131)

c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8.7c per lb of briquet, c.l. packaged 9.5c, ton lot 10.3c, less ton 11.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l. bulk 8.75c per lb of briquet, c.l. packed 9.55c, ton lot 10.35c, less ton 11.25c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 5.1c per lb of briquet, c.l. packed 5.25c, ton lot 6.7c, less ton 7.6c. (Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 5.25c c.l. packed 6.05c, ton lots 6.85c, less ton 7.75c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 17.50c per lb of alloy, carload packed 19.0c, ton lot 19.8c, less ton 20.8c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 16.25c per lb of alloy, carload packed 16.45c, ton lot 19.35c, less ton 20.85c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.75c, ton lot 7.5c, less ton 8.35c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.40c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone contract, 100 lb or more, 1" x D, $1.20 per lb of alloy, freight allowed. Less than 100 lb $1.30; Central, add 0.75c; Western add 2.9c, freight allowed. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.45c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, carload packed 17.25c per lb of material, ton lot 18.00c, less ton 19.25c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l., and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%; Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 39c per lb of alloy, ton lot 41c, less ton 43c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 15.0c per lb of alloy, ton lot 15.75c, less ton 17.0c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Graphidox No. 4: (Si 56%, Ca 5%, Ti 9%) C.l. packed, 16.50c per lb. of alloy; ton lots 17.90c; less ton lots 19.40c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%; V-7, Cr 28-32%, Si 15-21%, Mn 14-16%) C.l. packed, 12.95c per lb. of alloy; ton lots 14.60c; less ton lots 15.85c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base): Gross tons per carload, fob sellers' works, Mt. Pleasant, or Sigio, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.